NetworkWorld

CLEAR CHOICE TEST

VoWi-Fi

Of four vendors tested, only Aruba came through loud and clear. Page 38.

Consumer show meets net world

■ BY JOHN COX

LAS VEGAS — Beyond the high-end home theater speaker systems, paper shredders, advanced sewing machines and electrical adapters, the Consumer Electronics Show 2005 last week was, at least in part, about taking networks to the next level. CES is a gigantic laboratory of 2,400 vendors trying to figure out what you can do with a world of digitized information.

The keynote speech by Microsoft Chief Software Architect Bill Gates unintentionally revealed a theme familiar to network executives: Experiments don't always work. In a mock episode of "Late Night with Conan O'Brien," Gates talked about his vision of a "digital life style."

A look into the future

Venture capitalist offers look at '05 hot spots.

■ BY HOWARD ANDERSON, Senior Managing Director, YankeeTek Ventures

Let's get right to it. Let's see what this year portends:

1. 2005 will be worse than '04 for technology companies, but not bad. What do you mean you didn't notice last year's recovery?

2. PC growth will be in double digits, but barely — good for Dell, good for HP. It's time to trade up. Still, the market growth will be only two-thirds of what it was in 2004. Aren't you embarrassed by your Sony Viao, and don't you really want to upgrade?

3. Cell phones are booming; we will soon hit 1.5 billion worldwide. New data services will abound, and you will find a reason to upgrade. But cell phone growth will only be 10% more

Mergers, VoIP, open source, outsourcing to dominate news.

■ BY ANN BEDNARZ AND JENNIFER MEARS

CRYSTAL BALL 2005

What's in store for 2005?

Well, industry experts say to expect network industry merger activity — nearly $60 billion worth of which took place in one week last month — to continue unabated, and don't be surprised if this turns out to be the year enterprise-scale VoIP makes it to the mainstream. Look for licensing issues to be top of mind as vendors iron out the impact of server enhancements on application pricing. You might even catch a glimpse of Microsoft's long-awaited Longhorn software, albeit in beta only.

Analysts also expect to see increased emphasis on server consolidation, open source projects, offshore outsourcing and regulatory compliance.

There might be fewer vendors to choose from in 2005 if merger and acquisition activity does carry on, but the result could be broader, more integrated offerings from the vendors that remain. Those offerings could change the way IT executives fill out their data centers, secure their networks and link their far-flung sites.

"It's clear 2005 will be a really interesting, exciting and challenging time for our industry," says Frank Gens, senior vice president of research at IDC. He predicts "almost boringly moderate" IT spending growth of about 6%, but adds that "we will be dealing with an environment that's all about convergence of individual siloed market segments."

On the M&A front, BEA Systems will be among the first companies acquired, predicts Frank Dzubeck of Communications Network Architects. A logical

More insights for the year ahead:

- IT spending outlook: Keep pinching those pennies. **Page 10.**
- Columnists Dave Kearns, **page 22;** Scott Bradner, **page 26;** Johna Till Johnson, **page 27;** Mark Gibbs, **page 54;** and Paul McNamara, **page 54.**
- Our fearless forecast. **Page 34.**

A Wider Net

Forget about sleeping: It's Patch Tuesday

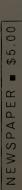Microsoft's monthly patch release triggers a race between hackers, vendors and customers.
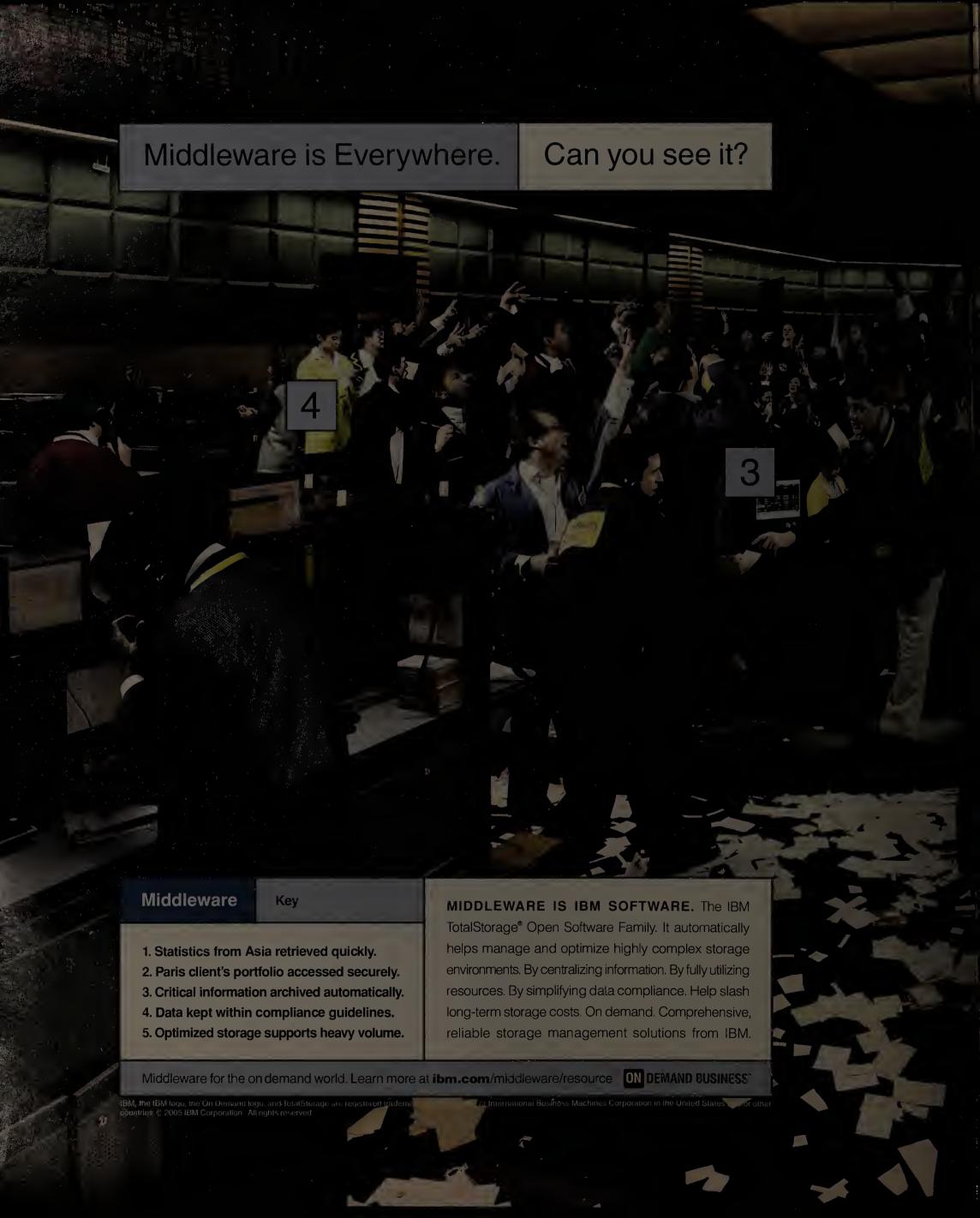
■ BY LINDA LEUNG

The engineers at vulnerability testing tool vendor nCircle spend $100 per month at the coffee shop in the lobby of their office building in downtown San Francisco. But there is one day each month when a trip to the cafe is more urgent than at any other time: Patch Tuesday.

As anyone involved in running a Windows network knows, this falls on the second Tuesday of the month and is the day when Microsoft announces product vulnerabilities and releases patches for them. For the nCircle engineers, it's the start of a very long
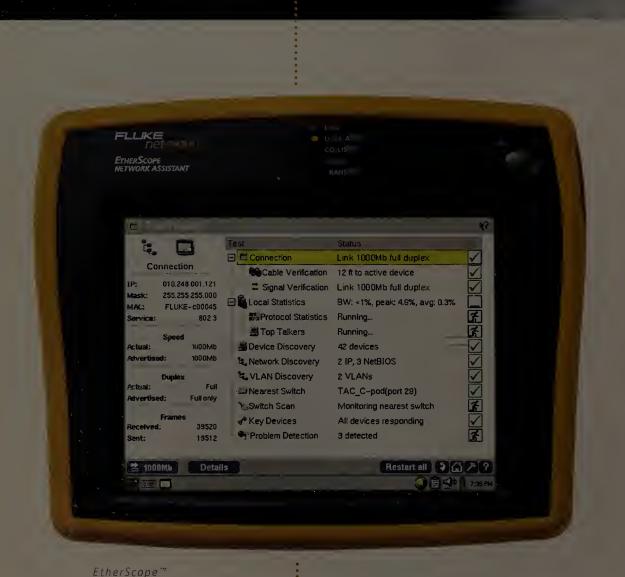
DAN VASCONCELLOS

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Middleware | Key

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2. **Paris client's portfolio accessed securely.**
3. **Critical information archived automatically.**
4. **Data kept within compliance guidelines.**
5. **Optimized storage supports heavy volume.**

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This week at *Network Life*: The Expert's Guide to the Connected Home
Every day *Network Life* offers everything you need to know to keep your — and your family's and friends' — home network humming. Get the latest news, opinions, reviews, how-tos and more.
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CES news roundup
Couldn't make the show last week? No problem — get the low-down on all the product announcements and launches, keynotes and events at our CES news page.
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New Network Life blogs

Security chief
Deb Radcliff gives you security resolutions for the new year and wants your feedback on the biggest problems when running a home network. **DocFinder: 5337**

Off the clock
Editor Keith Shaw looks at a great digital photo organizer and X2's "true" media center PC, and tells you how you can become a video gamer tester. **DocFinder: 5338**

Tech Spy
Where do routers come from?
Editor Toni Kistner reports on her trip to D-Link's manufacturing plant in Taiwan. **DocFinder: 5345**

Online help and advice

Nutter's Help Desk
Server network card problem
Help Desk guru Ron Nutter helps a reader who's online learning application is conflicting with network cards.
DocFinder: 5339

Small-Business Tech
HP's new all-in-one network inkjet printer
Columnist James Gaskin says HP's $999 Color All-In-One OfficeJet 9130 is worth every penny. **DocFinder: 5440**

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We've made it easy to access articles and resources online. Simply enter the four-digit DocFinder number in the search box on the home page, and you'll jump directly to the requested information.

New Bits

Microsoft releases anti-spyware beta

■ Microsoft last week tried to sharpen its focus again on security by releasing the first beta of the anti-spyware software it acquired when it bought Giant Software last month. The company also says that next week it will begin shipping tools for removing malicious code from a PC. Microsoft Windows AntiSpyware can detect and remove spyware, and block known spyware from infecting computers. The company didn't say when a shipping version of AntiSpyware would be available. Microsoft is making AntiSpyware available for Windows 2000 and later versions of the operating system. The company says it hopes users will join its voluntary SpyNet network to report potential spyware. The Windows malicious code removal tools are a compilation of three tools Microsoft released a year ago. While the tools don't prevent malicious code from infecting a PC, they can remove it. Microsoft will update the tools the second Tuesday of each month, the same monthly schedule for new patches.

Symantec, Veritas execs defend merger

■ The heads of Symantec and Veritas Software joined forces last week in New York in an attempt to allay investor worries about the proposed merger of the two companies. In a presentation and discussion with Wall Street analysts and shareholders on the rationale for combining the firms, Symantec CEO John Thompson said that the $13.5 billion proposed acquisition of Veritas by Symantec has triggered "some trepidation and skepticism." Thompson and Veritas CEO Gary Bloom tried to counter doubts by saying the two companies, which have teamed to sell the products to 29 corporate accounts in the past, expect to see 18% growth in the next fiscal year. While there is virtually no product overlap between Veritas and Symantec, Thompson said the two firms estimate there is about $100 million in overlap in things such as "back-office infrastructure," which will have to be resolved after the merger. There is no date set for a shareholder vote on the merger.

Ex-WorldCom directors to pay millions

■ Ten ex-WorldCom directors have agreed to pay $18 million out of their own pockets to settle a suit with the New York State Common Retirement Fund. The personal payment is part of a $54 million deal the lawyers for the former executives struck with the state. According to reports, the details are not yet public because the judge presiding over the case still has to approve the deal. Typically, when shareholders or investors sue a director, the company and the company's insurance pay the penalties. But in WorldCom's case, the boards were found to have shown poor judgment, and even neglect, for not recognizing fraudulent activities that eventually drove WorldCom into

He's standing by

Dave Piscitello writes: If you know how to write an operating system that is easy to use, trivial to network and perfectly secure, drop me a line. *Find out more at www.nwfusion.com, DocFinder: 5343.*

■ TheGoodTheBadTheUgly

Selling out. This past year was a good one for IT start-ups looking to get bought, according to research firm VentureOne. Vice President John Gabbert says 246 such companies fetched a combined $13.97 billion from acquirers, the most paid since 2001.

Cell phones vs. cells. A new study funded largely by the European Union has concluded that radio waves from mobile phones damage cells and DNA in humans and animals, according to a Reuters report. The four-year Reflex study, run by 12 research groups in seven European countries, did not find that mobile phones actually are a significant health risk but did suggest that more study is needed. The mobile phone industry denies conclusive evidence of harmful effects exists. ➤

BRIAN GAIDRY

No wonder IBM ditched it. IBM's PC business racked up $965 million in losses between Jan. 1, 2001, and June 30, 2004, the company has reported in a new filing with the Securities and Exchange Commission that details the planned sale of the business to China's Lenovo Group.

bankruptcy. The board members who have agreed to a settlement include Clifford Alexander, secretary of the Army during the Carter administration, and James Allen, former CEO of Brooks Fiber, one of the more than 70 companies WorldCom acquired in the 1990s.

IBM buys analytics specialist

■ IBM announced late last week that it has acquired privately held SRD for an undisclosed amount to fill out its business intelligence middleware portfolio. SRD makes analytics software that specializes in gleaning information about individuals' identities and discovering obscure associations from disparate data sources — for example, if someone is bouncing checks at five different banks using five different names or identities. IBM plans to integrate SRD's operations into its information management software group.

Minnesota to appeal FCC VoIP ruling

■ The Minnesota Public Utilities Commission plans to appeal a November decision by the FCC prohibiting states from regulating VoIP services, such as those offered by Vonage Holdings. This appeal of the FCC's ruling marks the second appeal by a state public utilities commission, after California filed a petition for review with the U.S. Court of Appeals for the Ninth Circuit in December. The commission's chief concern over the FCC ruling was how VoIP carriers would implement E911 services without state regulation. Commissioners also expressed concern over whether VoIP providers would contribute to the federal Universal Service Fund, which subsidizes phone service in rural and poor areas, and what services VoIP carriers would provide to people with hearing loss. In November, the FCC ruled that Vonage-style VoIP service should be free from most state regulation because the service can't practically be separated into intrastate and interstate components.
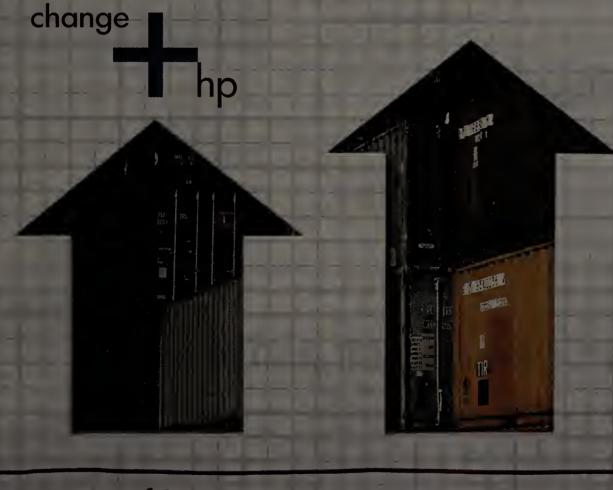
FTC reins in Wallace over adware

■ The Federal Trade Commission last week negotiated an agreement with Sanford Wallace and his companies, SmartBot.net and Seismic Entertainment Productions, to send online ads only to people who visit their Web sites and to refrain from infecting computers with adware until a lawsuit pertaining to this is resolved in federal court. The trial date to settle the complaint brought by the FTC against Wallace and his companies last October has still not been set.

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McData preps high-end storage switch

■ BY DENI CONNOR

McData next week is expected to roll out a long-awaited director-level switch that promises to let customers consolidate storage resources without sacrificing the security and isolation required by application data.

Although McData declined to comment, the company is expected to introduce the Intrepid 10000 Director, a Fibre Channel and Gigabit Ethernet switch with 2G-, 4G-, and 10G-bit connectivity. The switch is based on technology McData acquired when it bought Sanera Systems.

According to sources and earlier McData statements, the multi-protocol Intrepid 10000 will be able to be partitioned into as many as four logical domains using the company's Virtual Partitioning technology. Virtual Partitioning lets customers divvy up their storage area network (SAN) and isolate a business unit's applications and data, while consolidating data onto one device for management purposes.

Consolidating storage resources will be a major thrust of corporate users in the next year, says Stephanie Balaouras, a senior analyst with The Yankee Group.

"Customers plan to consolidate smaller port-count switches into larger, high-density switches and directors," Balaouras says. "Higher-port switches and directors will definitely assist in consolidation, easing some of the complexity of managing multiple SAN islands and bridging Fibre Channel and IP networks."

The Intrepid 10000 results from McData's $104 million acquisition of Sanera in October 2003. At the time, Sanera was making the DS10000, a multi-protocol intelligent switch that was capable of hosting storage applications such as mirroring, data migration and replication.

The Intrepid 10000 consists of eight blades, each containing four paddles. Each paddle can carry eight 2G-bit Fibre Channel or Fibre Connection (FICON) ports or a single 10G-bit Fibre Channel port. The entire chassis can support 128 4G-bit ports or 256 oversubscribed ports. McData is also expected to add Internet Fibre Channel Protocol (IFCP) and iSCSI routing into the Intrepid 10000 in the next year.

All 256 ports on the Intrepid 10000 are non-blocking to in-crease performance and accessibility. The 10G-bit capability will be used to create inter-switch links.

With the Intrepid 10000, data can be transmitted over distances of 1,200 miles at 1G bit/sec throughput, according to McData's earlier statements. McData's Enterprise Fabric Connectivity Manager will manage the switch.

The Intrepid 10000 will be sold through the OEM channel by companies such as IBM and EMC, which are currently qualifying it to run with their SAN gear.

Plenty of competition

The Intrepid 10000 will compete with CNT's recently announced UltraNet Multi-Service Director, Cisco's MDS 9509 Multi-layer Director and intelligent director-level switches from start-ups Maranti and Maxxan. While these other switches can host intelligent applications, such as replication and data migration, the Intrepid doesn't currently perform those functions. According to sources, future releases of the product will support storage applications through a bladed approach, using the company's Sphereon 4700i fabric switch.

Since Cisco's entry into the director-level switch market in early September 2003, the market's demographics have changed. According to The Yankee Group, McData led the market with nearly 47% in the second quarter of this year. Cisco has shown rapid growth — the company now leads Brocade, 24% to 23%. CNT has a 7.4% market share.

According to a report from Lehman Brothers, McData, which has five Intrepid 10000 customers, is taking orders for the storage switch. Pricing has not been disclosed.

McData also has promised a variety of other switch/router products by mid-2005. It is expected to ship the Eclipse 1640 SAN router, which supports the IFCP, iSCSI, Fibre Channel and Gigabit Ethernet, and several new mid-range Sphereon models: the 24-port Sphereon 4710 fabric switch, the 32-port 4700 and the 16-port 4400. All the Sphereon switches will be equipped with both 2G and 4G bit/sec Fibre Channel connectivity and FICON capability. ■

Intrepid adventure
How McData's Intrepid compares with other systems

Vendor/product	No. of ports	Protocols supported
Brocade Silkworm 24000	128	Fibre Channel FICON
Cisco MDS 9509 Multi-layer Director	224	Fibre Channel, iSCSI, Fibre Channel over IP
CNT UltraNet Multi-Service Director	256	Fibre Channel, iSCSI, Fibre Channel over IP, Gigabit Ethernet, SONET, FICON
Maranti CoreSTOR	128	Fibre Channel, iSCSI, Gigabit Ethernet
Maxxan MXV 500	256	Fibre Channel, Fibre Channel over IP, Gigabit Ethernet
McData Intrepid 10000 Director	256	Fibre Channel, Gigabit Ethernet, FICON

All these switches support 1G and 2G bit/sec Fibre Channel

Start-up to paint new switch picture

■ BY TIM GREENE

Start-up Matisse Networks promises that by year-end it will ship a distributed switch designed to connect the geographically dispersed elements of corporate data centers.

The company says that its equipment connects sites via fiber links more efficiently than current core switches operating in tandem with dense wavelength division multiplexing devices. It says it uses patented technology to do so less expensively and with fewer network devices than conventional means. With a distributed switch, elements would be geographically dispersed on a campus, for example, and behave as one switch, and also be managed as one entity.

The new equipment will rival high-bandwidth switch-routers made by Cisco and Extreme Networks that now are used to connect sites for distributed data centers.

A hint about the technology might lie in the company name, which comes from the Expressionist painter Henri Matisse. "Matisse was called the 'master of color,'" says Timon Sloane, the company's vice president of marketing. "We are also mastering color with our innovative use of the optical spectrum to deliver our distributed multi-protocol switch."

Matisse's distributed devices are managed as one switch that can be thought of as having a backplane of optical links, Sloane says. It can be used as the core of a corporate data network, leaving existing infrastructure in place, says company CEO Sam Mathan.

The Matisse switches are designed for anchoring networks within buildings, campuses and metropolitan areas.

This configuration simplifies network architecture by reducing the number of individual switches that connect sites that comprise a distributed data center, the company says. This also reduces capital expenses because the gear costs less than alternatives, and reduces operating expenses because there is less administration, the company says. The company would not quantify potential savings. According to Mathan, the distributed switch also increases available bandwidth on each fiber, although he declined to say how.

Matisse's switch will be available in the second half of 2005. The company will release details this summer. ■

■ PROFILE: MATISSE NETWORKS

Location:	Mountain View, Calif.
Founder:	Claude Hanou, former general manager of Terayon's Data Cable division.
Employees:	45
Funding:	$21 million from Menlo Ventures, Walden International and Woodside Fund.
Product:	Distributed multi-protocol data center switch.
Competitors:	Cisco, Extreme, Nortel
Fun fact:	Company founders see themselves as similar to artist Henri Matisse in breaking convention and viewing things from a new perspective.

Corrections

■ The test "Top spam fighters offer feature diversity" (Dec. 20, page 34) should have said that Barracuda does support SSL encryption for management.

■ In the story "Change management reins in SANs" (Dec. 20, page 29), the author's name should have been listed as Roy Alon.

■ The story "Reviewing our 2004 predictions" (Dec. 20, page 32) said AT&T sold off its wireless business to Cingular. It should have stated that AT&T Wireless was already an independent company.

Nokia for Business

Nokia One Business Server   Nokia Firewall/VPN Appliance   6820 Messaging Device

R.O. Ida, The CFO

The queen was in her counting house, counting all her company's savings. More specifically, when we caught up with R.O. Ida, the chief financial officer, she was tallying last month's savings, the result of a total mobility solution the Queen of Lean has begun implementing.

What's up with that jar full of old rings and tarnished coins on your ...

Shhhh! 2,997, 2,998, 2,999, three thousand dollars! Wow, right to the bottom line. And we haven't even reined in all the runaway mobility expenses yet. Oh, the jar.... It's stuff I found with my metal detector.

You're smiling, which is odd for a CFO; are you actually enjoying yourself?

It sure beats signing expense reports—they're what I like to call a salesman's best shot at creative writing! But what really gives me a kick is saving money, and that's what we're doing here now with our new total mobile strategy.

A strategy for all mobile services? Why not let individual departments decide what's best, or even the individuals themselves?

That's what got us into a big mess in the first place. Until recently, we had five different mobile service providers. We had hardware from eight different vendors. We had incompatible mobile email solutions. It was hard for us to guarantee security with such a rat's nest. And man, was it expensive. Tell you the truth, we had a really hard time just tracking the expense. To people like me, that's like not knowing the day of the week.

So what did you do?

I was complaining about this to a friend while we were window shopping, and she said, "Call Nokia." So I did. It wasn't just a business query—it was an S.O.S., because we were spending a third of our IT budget on mobility. After routine IT maintenance, we were left with zippo for strategic development. It was like throwing good money into a parking meter—there was just no return.

What did Nokia do for you?

For starters, they helped us develop a total mobile connectivity solution, with uniform high-speed remote access to give our road warriors the info they need no matter where they are, and quickly. They layered in just the right amount of security, including a secure VPN. And they gave our administrators real easy-to-use tools to assign access privileges based on user identity. This was our foundation.

Then what?

Slowly but surely, we developed a plan with Nokia to get rid of a lot of the incompatible, clunky mobile hardware and replace it with intelligent Nokia devices. They are built to work seamlessly together, which means fewer calls in the middle of the night from far-flung corners of the globe to our help desk. And less help-desk expense. With their guidance, our mobile workers get just what they need, but no more. I like that. Now we inventory all new devices, and maintenance and replacement schedules are predictable. I really like that.

Anything else?

You bet. Everyone knows the killer app today is email. It's the lifeblood for our mobile workers. Nokia worked with us to provide a uniform, simple, and highly reliable mobile email solution that has saved us big bucks. They helped us fine-tune the solution to the different devices our IT guys deploy, because some road warriors like to use their PDAs for mail, others like their laptops, and still others prefer their smart phones. Me—I just love the dollar savings that come from a single, predictable, and reliable mobile email solution.

Sounds like Nokia helped you find a key to the efficiency kingdom.

Yeah, and I didn't have to use my metal detector to find it. Now, if you'll excuse me, it's lunch time and I'd like to balance my checkbook. By the way, the time's out on your parking meter.

Interviewer Bill Laberis was editor-in-chief of *Computerworld* for ten years (1986-1996). He is president of Bill Laberis Associates, a custom publishing and content company (www.laberis.com). His columns, Webcasts, supplements and magazines are well-known and respected throughout the high-tech industry.

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acquirer is Computer Associates, he says. One of BEA's assets is its WebLogic enterprise service bus. "CA could use that to link all of Unicenter together," Dzubeck says.

While it didn't nab SAP, Microsoft is expected to make some move to acquire middleware technology. "The leverage within the enterprise is moving up the stack, closer to the business process," Gens says. "Microsoft needs to strengthen its position. We're not going to speculate as to who they will buy. Certainly that community of application vendors and some of the integration platform vendors is where we believe Microsoft will target."

Cisco, too, will add to the acquisition frenzy. The company has historically been an acquisition ace, building its router, switch security and VoIP business lines on acquired companies' technology. Last year it used acquisitions to enter new markets, such as widearea storage management, and to augment its existing technologies. By year-end, Cisco had announced 12 acquisitions worth more than $700 million. Expect at least as many deals in 2005.

Awake at night

Security continues to dominate IT mindshare — and the emergence of wireless protocol exploits will do little to quell that. Mikko Hyppönen, director of antivirus research at F-Secure, suggests this frightening scenario: A wireless-enabled laptop infects other wireless devices simply through their proximity to the infected machine.

The possibility of that happening is real, he says. "The fact that computers are listening to over-the-air traffic means they are, at least in theory, vulnerable to protocol exploits, which would be able to infect them just because they are too close to an infected computer," Hyppönen says. "Sooner or later — if not in 2005, maybe in 2006 — we will see exploits using these wireless connections."

Even if a user has a firewall or VPN to secure the wireless connection, the computer still is listening to the radio waves, he says. "The more I think about it, the more I'm worried about it," Hyppönen says.

Uncrackable viruses also could be on the horizon. Authorities put up their best numbers yet in 2004 with respect to arresting virus writers, but unfortunately the people they're catching are hobbyists and teenagers, Hyppönen says. The biggest threats come from professionals who are beefing up their arsenals.

"Since the first PC viruses came 18 years ago, so far we've been able to crack every single virus. But that could change," Hyppönen says. "Our enemy is professional and is actually investing money in the development of their attack tools and their viruses."

Another issue that keeps enterprise IT executives up at night is compliance with regulatory initiatives. In particular, the Sarbanes-Oxley Act of 2002, intended to deter fraud and protect investors by establishing more stringent standards for corporate governance, is commanding an increasing share of IT resources.

Spending on compliance with the Sarbanes-Oxley Act will reach $6.1 billion in 2005, according to AMR Research. A healthy chunk of money spent — $1.71 billion, or 28% — will go to technology. However, the primary resource consumer is personnel: Internal head-count costs will total $2.08 billion, or 42% of compliance spending, AMR says.

Regulatory and compliance concerns, combined with continued mergers and acquisitions this year by large corporations requiring identity integration, will keep identity management top of mind, says Earl Perkins, vice president of security and risk strategies at Meta Group. What remains to be seen is how corporations attack identity management — from a traditional top-down provisioning and workflow stance, or via federation. The concept of federated identity calls for users to authenticate themselves to their local network and then pass that authentication to partners for access to services or data on the partner's network.

"Federation is just catching its breath and merging with Web services security and starting to appear in some early key implementations," Perkins says.

Toys for the data center

Consolidation has been the rallying cry in data centers for a few years, and 2005 will be no different.

Look for switches to become multifunctional, with LAN switches handling more network services roles such as IDS and firewalls, for example. One big driver is to reduce the number of boxes network administrators have to handle. That also will result in smarter switches that can pass information back and forth with servers, keeping track of application availability, for instance. Also watch for more 10G Ethernet switches to be deployed in the LAN core as servers become more powerful and enterprise data center managers look for ways to transport data more quickly.

The blade market will continue to heat up. Dell re-entered the market in November, and analysts expect that to help push prices down across the low end of the server market.

"Most vendors have come out with lower-cost blades, industry-standard, less fancy blades aimed at the lower end of the market.... This could be the year where there are a lot of products like that in the pipeline," says Charles King, principal analyst with Pund-IT Research. IDC expects the blade server market to top $1 billion in 2004 and be more than $2 billion in 2005.

Overall, the downward pricing pressure will continue across the server market as commodity servers take on more powerful roles through clustering and virtualization.

Indeed, the server virtualization market will see strong growth in 2005 as IT managers look for ways to get more out of existing resources. Microsoft has entered the market with Virtual Server 2005, which should help drive the technology mainstream. VMware, an EMC company, dominates the market, and analysts expect it to keep that lead. IDC predicts the virtual machine software market will increase 15% next year, and expects a number of start-ups and veteran companies to come out with technology to virtualize applications across servers.

On the processor front, Advanced Micro Devices took the early lead with its 32-/64-bit Opteron chip and will again be out in front when it comes to dual-core x86 processors. AMD says it will release a dual-core Opteron in 2005, but Intel has pulled back on plans to release a dual-core Xeon this year. While enterprise users can expect to see dual-core Itanium-based systems by year-end, dual-core Xeons won't ship until 2006.

For the best of both worlds, servers based on 32-/64-bit chips will continue to make headway. Opteron-based systems will be sold running primarily Linux for high-performance computing, while Intel's EM64T will establish itself as a Windows platform in existing 32-bit environments, analysts say. That is helping give Intel an edge in the 32-/64-bit world, where 60,000 EM64T-based servers were shipped in the third quarter of 2004, compared with 54,000 Opteron-based systems.

But all this innovation is not without its penalties. Virtualization, capacity on demand, multi-core processors and other server

Another year for moderate spending

It will be more of the same in 2005, according to market research firms, which forecast IT spending to grow between 6% and 9% over 2004 budgets. That means IT buyers will continue to keep a close watch on their IT dollars, and increase spending only sparingly in key areas.

Separately, Forrester Research, Gartner and IDC announced their predictions on how many IT dollars will be doled out for new technology in 2005. Each group reported that corporate IT purse strings won't get much looser in the coming months. But the news remains positive as even a moderate increase bodes better than flat budgets, or plans for more cuts.

"IT executives . . . painted a picture of increasing optimism for budget outlays for IT products and services in 2005," says Brian Smith, an analyst at Gartner Research. "A net of 57% more budgets will head upward than downward."

Forrester determined spending could increase about 7%, and Gartner, with the most optimistic forecast, polled 500 IT executives in December, and found budgets could increase by 9% overall. Yet IDC forecasts a smaller increase of 6% — or about $60 billion in new IT dollars to be spent.

"We expect there to be a little more than $1 trillion spent on IT in 2005, which represents very modest growth," says Frank Gens, senior vice president of research at IDC. "It's a slow economic recovery, and it's keeping a bit of a lid on the industry, making IT a buyer's market for another year."

Forrester attributes modest growth, which it expects will continue through 2008, to a natural technology adoption rate among IT buyers. It says, until 2000 or so, companies were buying new technology wares hand over fist. Now companies need to digest.

"The tech economy will keep chugging away like this until the next big period of new investments arises," says Andrew Bartels, a vice president with Forrester. "The 7% growth rate is about in line with the overall economy. We are not in a tech recession, but we won't see double-digit increases for a few years yet."

Among the new technologies expected to garner the lion's share of cash are infrastructure software — specifically security wares such as identity management products — smart handheld devices, PCs, network equipment and application software. IDC says each market will see about $5 billion to $6 billion in new dollars in 2005.

Forrester's findings parrot IDC's numbers. According to Bartels, security software will see a 12% growth within the overall software group, which will increase in line with the average 7%.

On the negative side, while demand for routers, switches and network security devices "kicked into high gear" in 2004 with a 14% increase over 2003, the coming year doesn't bode well, according to Forrester. "The financial struggles of telcos will lead to cutbacks in their own IT investments in 2005, causing overall growth in new investments to shrink to only 4%," Bartels says.

— Denise Dubie

More online!

Hear Andrew Bartels of Forrester discuss IT spending trends in 2005.

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architectures that give boxes more processing power and flexibility have forced software vendors to take a closer look at how they license their applications.

Oracle, IBM and Sybase say they will consider each core a CPU for licensing purposes, but analysts note that two cores on a die might not necessarily mean double the performance. Microsoft is alone in saying that it will charge strictly per CPU, regardless of the number of cores. Gartner predicts companies that license by CPU could see software costs increase by 50% or more by year-end if they don't press software vendors for changes in pricing and licensing policies.

One licensing approach that's gotten a lot of lip service will continue to disappoint: utility-based software pricing.

Lots of vendors talk about software being doled out and sold like a utility. But it's not a reality yet, according to Gartner. What's available today from software vendors promoting "utility-based" pricing models are simply billing variations on traditional licensing models.

Charging companies by the seat for software is like utility companies charging customers according to the number of light bulbs and appliances in place in a home, rather than by how much power is actually consumed, the research firm says. Through 2006, no enterprise application vendor or application service provider will offer a true utility-based pricing model, Gartner says.

Software trends

Linux will continue to be the fastest-growing server operating system. While Windows holds on to its dominant position, Linux is expected to account for about 20% of volume server shipments in 2005, up from about 18% of the market in the third quarter of 2004.

"That's more than twice the rate of growth of Windows and still less than a third of Windows' share in volume, but it's into a very interesting level," IDC's Gens says.

More large enterprise users, such as the Department of Defense, look favorably on Linux, and analysts expect that to expand in 2005, with users bringing in commercial Linux distributions. "The romantic image of people buying into open source because they don't want to pay a lot of money is a bunch of hog-

wash, and, in fact, there are a lot of other reasons why people are moving toward open source," Gens says.

Meanwhile, 2005 is expected to be the year that open source makes a big move beyond infrastructure services such as file and print. The adoption of open source databases such as MySQL and open source application servers such as JBoss will be on the rise as enterprise users get more comfortable with Linux moving up the stack.

Outside the open source camp, Microsoft isn't resting on its laurels.

Microsoft will continue its heavy focus on security in 2005, because the company still needs to prove to the market it can get it right. First up will be the delivery of patch management help that is critical to proving Microsoft can provide competent tools to control its own platform.

Key software for corporate customers that Microsoft plans to deliver in 2005 includes Windows Server Update (code-named R2), even though some key features have been stripped out; versions of Windows Server and XP for processors that support 64-bit extensions; and the first betas of Microsoft's Longhorn client and server.

New and old

The offshore outsourcing trend isn't going away. Onshore providers such as IBM Global Services, Capgemini, Accenture and HP are increasing their offshore presence, and the services offshore firms provide are becoming increasingly complex, moving into areas such as CRM, call centers, and remote infrastructure and application management.

Companies in growing numbers will look to offshore IT service providers in 2005 as a way to cut costs. However, the offshore backlash will continue: According to Gartner, through 2006, half of U.S. companies planning offshore outsourcing will experience friction from the public-policy arena in making and executing their decisions.

Meanwhile, 2005 could be the year for VoIP. Companies such as Ford Motor, Boeing and Bank of America are testing the VoIP waters, and analysts expect more enterprise users to follow suit. "VoIP will go mainstream, at least in the enterprise," IDC's Gens says.

Some of the year's big trends come from new interest in old technologies, such as the IT Infrastructure Library (ITIL).

This could be the year the ITIL framework goes mainstream in the U.S., analysts say. ITIL is a set of management best practices that help network managers set processes and better document IT actions for future audits, such as those related to new regulatory legislation. "After nearly two decades of slow growth adoption, it looks as if ITIL may experience its big breakthrough" in the U.S. in 2005, says Rich Ptak, a principal at Ptak, Noel & Associates.

All eyes also are on the use of radio frequency identification (RFID) technology. Around for a half-century, RFID is finding a place in supply-chain infrastructures, fueled by some big-name backers. Wal-Mart's well-documented RFID pilot kicks off this month, with 137 suppliers due to start tagging cases and palettes of goods destined for the retailer's three designated distribution centers. ∎

What's hot and what's not

Hot	Not
M&A	Going it alone
Network quarantines	After-the-fact intrusion detection
One-stop platform shopping	Best of breed
Spyware, phishing	Privacy
Storage, server virtualization	Underutilized boxes
Multifunction LAN switches	One-trick ponies
Open source	Paying full price for commercial apps
ITIL	Six Sigma
Offshore outsourcers	Systems integrators
Pay-per-use apps	Shelfware
Blade servers	Big boxes
Multi-core chips	Hot-running processors

Anderson

than 2004, down from 30% growth in 2003. Saturation is rearing its ugly head. The cell phone is the new display device. Don't you want a GPS phone with a built-in Palm/camera and iPod? Of course you do!

4. The Internet is back … not like 2000, but some of those ideas are cooking. The Internet is still a revolutionary technology, and now that the worst ideas have been shaken out, it's on the move.

5. Application service providers — like Salesforce.com — will re-emerge. Everyone wants to buy by the drink; no one wants to own the bar. Lots of start-ups. The pricing model destroys the economics of the older line firms, but it's the way companies really want to buy.

6. IPOs start warm and then get hot. There are too many companies that need to raise money and that have a track record to prove it. No Googles but no Pets.com, either. These fledgling IPOs are backed up like airplanes on a rainy Friday afternoon at LaGuardia.

7. Storage is up — isn't it always? No corporation will throw away any data — ever. The problem is that the price of storage is down. Gotta love EMC.

8. Tech spending by big companies will be up 4% or maybe 5% — about half the growth of the economy. The trouble is, every firm has forecasted a 10% increase in market share. IBM grows in single digits.
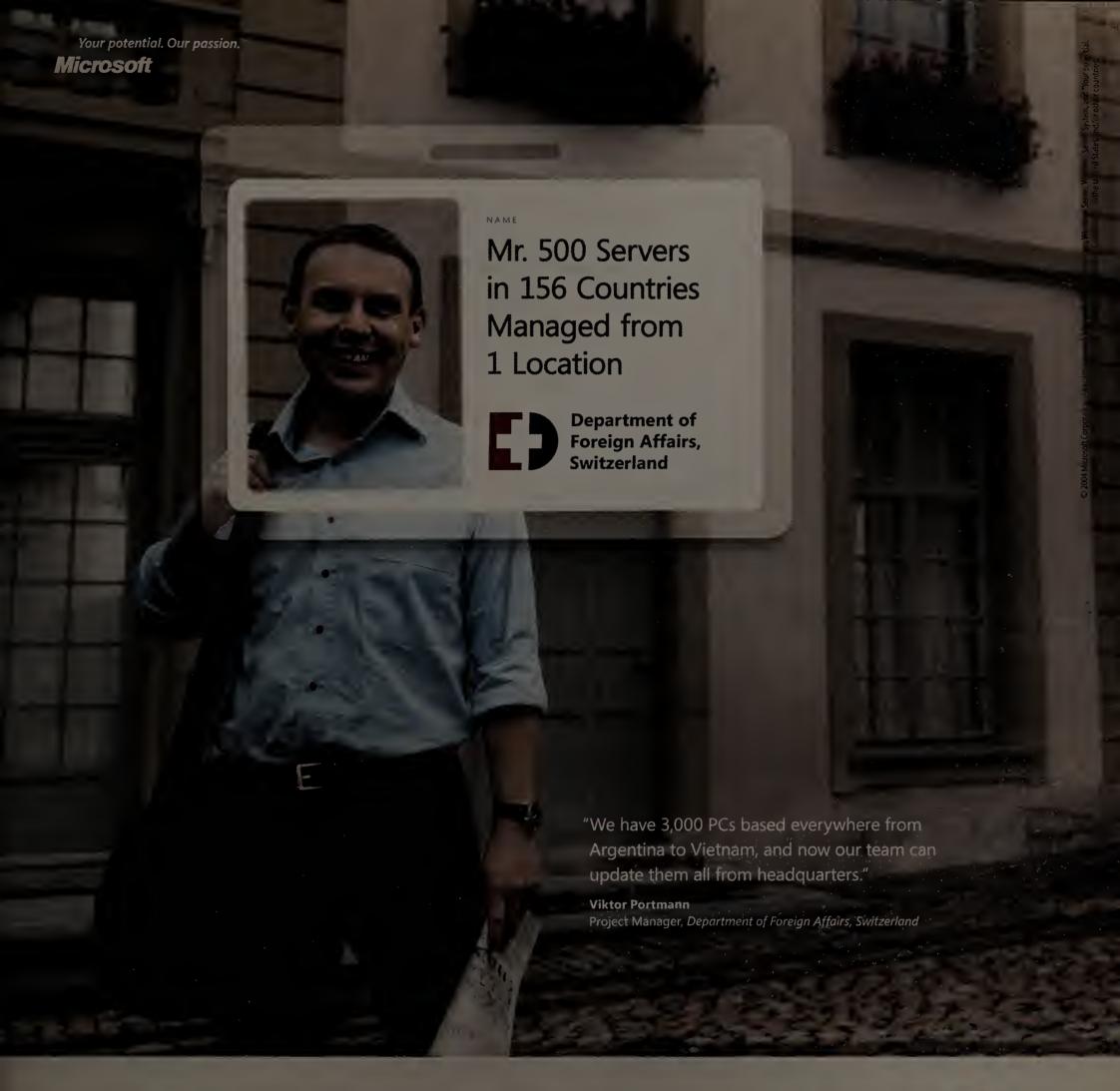
9. Texas Instruments will continue to kick butt with its Display Systems Protocol chips in cell phones and its digital light processing chips in large TVs. You are about to enter the world of high definition, and size does matter.

10. Exports are up and imports are down as the U.S. dollar continues to get beaten up. Which is good. Everyone wonders when the Chinese will devalue, but it really doesn't matter. Everything is getting built in China.

11. Japan, which looked like it was coming out of its slump, goes back into it. They are 1 for 20 — 20 being the last 20 years. Amazing that they haven't figured it out yet.

12. China is on everyone's mind. It dominates the low end of technology and threatens the high end. Everyone predicted the former and no one the latter, and it's the latter that has everyone scared out of their minds.

13. Backlash coming on outsourcing but not enough to stop it in its tracks. The price advantage of India dissipates as India explores re-outsourcing to China.

14. Cisco struggles at the high end vs. Juniper as telcos want big-muscle machines. Cisco holds its share in the corporate world but no longer grows at 40% per year. Makes lots of little acquisitions.

15. Corporations continue to be skinflints, not because they don't have the money (they do), but because they don't see the payoff. They are still intent on driving down the cost per transaction. Big software companies such as Oracle and Computer Associates have a hard time.

16. HP struggles more than most, and calls are made for CEO Carly Fiorina's head.

17. There is no New Big Thing this year.

18. The digital home is one of the few bright spots.

19. Linux continues to go mainstream — everyone says they are onboard. The open source movement becomes a love-in.

20. VoIP is a given everywhere but on Mahogany Row.

21. Blade servers are everywhere — and they are based on open source. Take that, Sun!

22. The Sarbanes-Oxley Act is almost but not quite the spending driver that Y2K was. Beneficiaries: SAP, Mercury Interactive, Symantec.

23. ERP and CRM are dead, and there is nothing hot to replace them.

24. "Excess capacity" becomes a dirty phrase; IT people want "just-in-time" capacity.

25. Cell phone safety becomes an issue as more than a few spontaneously ignite.

Anderson is senior managing director of YankeeTek Ventures, a Cambridge, Mass., venture capital fund for early-stage technology companies. He is also founder of The Yankee Group and the William Porter Distinguished Lecturer at the Massachusetts Institute of Technology. He can be reached at handerson@yankee tek.com.

NAME

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UPS veteran takes over as CIO

■ BY ANN BEDNARZ

Dave Barnes learned a lot about how UPS operates in his ascent from part-time package handler to senior vice president and CIO. He joined the Atlanta company in 1977 as a college student and last week was elevated to the company's highest technology position.

In between, Barnes held multiple positions in the U.S. and abroad, including stints in operations, finance, internal audit and at UPS Airlines. Most recently he was vice president of customer and operations application portfolios, charged with coordinating global application development and overseeing the direction of 3,000 of UPS' 4,700 IT workers.

UPS' Dave Barnes is prepared to tackle the security challenge in his new role as CIO.

Working in different departments at UPS has given Barnes business knowledge that's key to being a successful CIO, he says.

As CIO, Barnes will have say-so over the company's $1 billion IT budget and an opportunity to help set corporate strategy as a member of the UPS Management Committee, which directs its day-to-day management.

Improving operations requires an attitude of "constructive dissatisfaction," he says. "We're a good company with market-leading processes. But there are always ways to make it better. The key to that is to be constructively dissatisfied."

Security continues to be a priority for UPS. Barnes bears the weight of the typical IT security issues posed by viruses and other threats. Physical security of buildings and vehicles also is becoming more critical to IT, as these resources play more important roles in synchronizing global commerce, he says.

"The movement of goods and the movement of information are really tied together. You can't have one without the other in today's environment," Barnes says.

One of the company's current challenges is to continually improve a system for tracking goods that's flexible and comprehensive enough to support multiple technologies. For example, UPS depends on bar-code scanning systems built for the familiar hand-held unit UPS drivers carry, called Delivery Information Acquisition Device (DIAD). It's also been piloting radio frequency identification (RFID) technology for tracking goods at the case and palette level throughout the supply chain.

"The movement of goods through the supply chain can be captured by a combination of technologies. It might be RFID, it might be delivery information from the DIAD, it might be bar-code scanners," Barnes says. In order to have that information flowing, you have to have secure systems."

Barnes succeeds Ken Lacy, who is retiring after 37 years with UPS. ■

Wireless group studies 'Super 3G' standard

■ BY JIM DUFFY

The 3G Partnership Project — a consortium of 200 wireless vendors and operators — has begun a study to determine the feasibility of defining a standard that supports wireless downlink speeds as high as 100M bit/sec.

For users, the technology promises greater bandwidth for support of new and emerging wireless applications and services. For service providers, it could introduce radio spectrum efficiencies and herald a new wave of revenue-generating services.

At its December 2004 meeting in Athens, the group agreed to "undertake a study on the longer term evolution of the [3G] radio interface," a 3GPP spokesman says. The study will be conducted by the 3GPP's Radio Access Network (RAN) working group, which expects to complete its investigation in June 2006.

Specifications for this "Super 3G" standard might be ready by June 2007, according to the 3GPP spokesman.

Although the proposal for the study was authored by 26 firms within the 3GPP — including NTT DoCoMo, Alcatel, Cingular Wireless, Ericsson, Lucent, Motorola, Nokia, Nortel, Qualcomm, Siemens, T-Mobile and Vodafone — the work will include all 200 members of the 3GPP, the spokesman says.

The project follows up a 3GPP RAN Longterm Evolution Workshop that took place in Toronto last November. The work does not specify any particular technologies — such as High-speed Downlink Packet Access (HSDPA), Evolution-Data Only (EV-DO), Universal Mobile Telecommunications System (UMTS) or Orthogonal Frequency Division Multiplexing (OFDM) — but indicates a need for identifying methods for greater bandwidth that maximize the use of the radio spectrum, and offer increased flexibility for the delivery of future services, the spokesman says.

The study's task is to define the relevant technologies, spectrum requirements and other issues — and then to launch the standardization activity, he says.

Currently, 3G technologies, such as EV-DO and UMTS, offer speeds of up to 2.4M and 384K bit/sec, respectively. Both are based on Code Division Multiple Access technology.

OFDM provides download speeds between 1M and 1.5M bit/sec, and upload speeds between 300K and 500K bit/sec. HSDPA, which is being trialed by Cingular and other operators, offers data rates up to 14.4M bit/sec.

With these available options and work underway to define fourth-generation (4G) wireless standards, some analysts question the need for Super 3G. The all-IP-based 4G, which NTT DoCoMo has tested since 1998, is said to reach speeds of 100M to 300M bit/sec. It's considered by some — like India's IT and communications ministry — to be a more cost-effective high-speed alternative to 3G.

"There are a number of standards already out there — and being formed at the present time — to define 4G," says Larry Swasey, a senior analyst at Visant Strategies. "It seems, at least for the next four or five years, the plate's set: You know what you need, you know what you're going to use. So Super 3G isn't really relevant until someone shows a market need." ■

Airing alternatives
Current and emerging options for high-speed wireless.

Technology	Speed	Status
UMTS	Up to 384K bit/sec (burst)	Available
OFDM	Up to 1.5M bit/sec	Available
EV-DO	Up to 2.4M bit/sec (burst)	Available
HSDPA	Up to 14.4M bit/sec	In trials
4G	Up to 300M bit/sec	In trials

NT holdouts paying a price

■ BY JOHN FONTANA

Although Microsoft last month offered users what appeared to be an olive branch by extending fee-based custom support for NT through 2006, the service's flat-rate pricing instead reinforces to many a curt message: Get off NT.

Some users have reported price quotes on custom support for NT as high as $250,000 for six months. Microsoft didn't disclose its flat-fee pricing when it extended the custom support program.

"I thought the quote Microsoft gave us was quite insane," says a network executive, who asked not to be identified. He was looking to support a small number of NT servers and workstations, but gagged on the $250,000 price tag. "It seemed like Microsoft was offering some hope, but not really."

Analysts say the reality is that NT, first introduced in 1996, is dead even though Gartner estimates that more than 10% of installed desktops in large companies and up to 20% of installed Windows servers still are running it.

"The pricing is kind of an incentive to upgrade isn't it?" says Jeff Allred, manager of network services at the Duke University Cancer Center. Allred, who is down to one cluster of NT servers and plans to replace with Windows 2003 within six months, says he is glad he has staff in-house to support NT.

According to Gartner analyst Tom Bittman, Microsoft does not publish support prices because they are part of custom deals and negotiating points with those who plan to migrate.

"Microsoft is not motivated to help unless you plan to migrate, because there is not a lot of money to be made in support of NT," Bittman says. He adds custom support is particularly unfriendly to any company with just a few NT boxes because support is priced per company, which means a company with five NT servers pays the same price as one with 1,000.
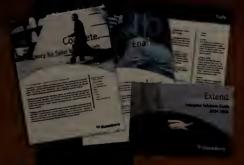
Support for NT, which had been extended previously, was slated to expire Jan. 1, 2005. A December report by Gartner said custom support for NT workstations and servers traditionally has been $200,000 per year. With the offer made in December, Microsoft said customers could sign up for contracts that ran only three months to control costs and provide flexibility for those close to completing migrations.

"This is a custom piece of support, so you are going to pay through the nose for it," says Laura DiDio, an analyst with The Yankee Group. "Support is going to become much more expensive if you stay on these old systems."

The situation that NT holdouts find themselves in appears to be a result of evolution.

"It used to be quite common for users to load up an app and it just ran and ran," says Gordon Haff, an analyst with Illuminata. Those "functional" set-ups have become obsolete with pervasive computing, he says. "Now a system has to be secure as well as functional, and that is a whole different dynamic. That means it is not OK to run an [operating system] that is not supported any longer. NT 4 is in that category, functional but not supported." ■

CES

Interviewed by O'Brien, Gates said Microsoft can enable that lifestyle with products available today, such as Windows XP Media Center Edition, Portable Media Centers, MSN online services and the Xbox game console.

But minutes later, a Windows XP Media Center Edition PC repeatedly failed while showing a slide show of digital photos of O'Brien and Gates out for a night on the town.

But that didn't stop other CES vendors from demonstrating an array of network and client technologies.

Future nets

Some of the most advanced wireless network technologies were on display, including multiple input multiple output (MIMO) and ultrawideband (UWB). MIMO is the basis of the next IEEE WLAN standard, 802.11n, which will have a minimum throughput of more than 100M bit/sec. UWB will appear later this year in products that create a wireless USB connection among a plethora of devices such as PCs, flat plasma screens and media servers.

Samsung Electronics and Athena Semiconductor demonstrated the effects of their just-announced jointly developed MIMO product: a single integrated circuit that incorporates three transceivers. The demonstration transmitted two high-definition TV streams and one standard-definition videostream over a link that maintained a consistent throughput of more than 50M bit/sec.

Cisco's Linksys announced a wireless 802.11g router and client PC card based on Airgo's MIMO chipset. The chipset package uses two radios, three antennas and Airgo's algorithms to boost 802.11g range by up to three times, and throughput by up to eight times.

A conventional 802.11g access point has a data rate of 54M bit/sec but useable throughput in the range of 18M to 24M bit/sec. It reaches about 300 feet, although throughput drops as distance increases.

Nearly two dozen companies showcased the rapidly evolving UWB wireless technology. UWB transmits data at very low power, at an optimal range of about 12 feet, with throughput of about 400M bit/sec. One of the first uses likely will be to replace USB cables with a UWB wireless connection between PCs and peripheral devices. Another use is a wireless version of the FireWire 1394 standard, which defines a method for high-speed streaming video applications.

The Multiband OFDM Alliance — which includes chip makers, software developers and a pack of name-brand consumer electronics vendors — is promoting one version of UWB. Members say they expect products out by year-end, initially for wireless USB. Freescale Semiconductor, a Motorola spinoff, is promoting a rival UWB version. The two groups are fighting it out in the IEEE 802.15.3a task group, but both plan to go ahead with products whether or not the IEEE standard advances.

Start-up Video54 Technologies unveiled a wireless beam-steering technology, dubbed BeamFlex, that uses software and multiple antenna arrays to direct standard 802.11 wireless LAN (WLAN) signals around radio interference and physical barriers.

The company, headed by Selina Lo, former marketing executive at Alteon WebSystems and Nortel, says that BeamFlex creates a threefold boost in WLAN throughput and range. The technology is intended to optimize WLAN signals for streaming video. WLAN vendor Netgear is building BeamFlex into its RangeMax line of WLAN products.

Such devices will accelerate the demand for vast numbers of IP addresses. A CES panel on IPv6, which is designed to break the current Internet addressing logjam, said this next-generation scheme will make it much easier to configure devices automatically, make every IP device addressable and forge secure peer-to-peer connections that promise to finally break the back of spammers.

Panelists acknowledged that U.S. adoption of IPv6 is slow but expect it to begin picking up speed this year, partly as the result of Microsoft's plan to introduce IPv6 as a native element in the Longhorn release of Windows XP, in 2006 for clients and 2007 for servers, and partly as the result of the Department of Defense's decision last year to mandate the use of IPv6 in its IT purchases. Microsoft is using IPv6 in 12 buildings on its Redmond, Wash., campus, says Ted Tanner, architectural specialist with the company's Strategic Relations and Policy Group.

Panasonic is scheduled this year to introduce additional products, besides its current crop of digital cameras and home gateways, that will support IPv6 as an option, using the current release of Windows XP. And that's just the beginning, says Alexander Ramia, senior group manager with Panasonic Technologies. He sketched a vision of Panasonic appliances installed in a home and accessible via a network connection and IPv6 addresses.

A new breed of service providers, for Internet-based VoIP phone service, was out in force. Level 3 Communications, a wholesaler of VoIP services to RBOCs, cable companies and others, announced it can now offer E911 services to about 60 million U.S. households.

The new capability means service providers now can identify automatically a 911 caller's address and pass that data to police, firefighters or EMTs. Previously, a VoIP provider could provide only a caller's phone number.

"Our partners can now replace the land line" with VoIP, says Cynthia Carpenter, vice president of marketing for Level 3's consumer voice services.

"VoIP will be the phone line," she says.

VoIP providers such as BroadVoice fielded questions from attendees. "Can I listen to my e-mail messages?" one user asked. "What happens if someone sends me a fax?"

Anyone with a broadband connection can use the BroadVoice service, said Leslie Berry, vice president of customer care. A phone adapter lets customers use touch-tone phones to make and receive calls via a DSL router or cable modem, through the BroadVoice IP servers.

The company recently introduced an 802.11-based wireless IP phone, which lets subscribers make BroadVoice calls over any open WLAN network.

The IDG News Service contributed to this story.

Gawkers, gadgets and celebrities — including Bill Gates, bottom left, and talk show host Conan O'Brien, bottom right — were plentiful last week at the Consumer Electronics Show in Las Vegas.

Net Infrastructure

NIST mulls new WLAN security guidelines

■ BY ELLEN MESSMER

The National Institute of Standards and Technology, the federal agency responsible for defining security standards and practices for the government, plans to issue new guidelines pertaining to wireless LANs in the near future.

The decisions NIST reaches, possibly as early as this month, will broadly affect federal agency purchases of WLAN equip-

ment, because federal agencies are required to follow NIST recommendations. According to William Burr, manager of NIST's security technology group, the agency is focusing on whether to approve the IEEE's 802.11i WLAN security standard for encryption and authentication as a government standard. The IEEE approved 802.11i last July, but Burr says NIST is not keen on some aspects of it.

Specifically, NIST has reservations about the so-called Temporal Key Integrity Protocol (TKIP), which is the key management protocol in 802.11i that uses the same encryption engine and RC4 algorithm that was defined for the Wired Equivalent Privacy protocol (WEP).

The 40-bit WEP, used in many early WLAN products, was criticized widely in the past two years as having too short a key length

and a poor key management scheme for encryption. TKIP is a "wrapper" that goes around WEP encryption and ensures that TKIP encryption is 128 bits long.

TKIP was designed to ensure it could operate on WLAN hardware that used WEP. In contrast, the 128-bit Advanced Encryption Standard (AES), which NIST already has approved, requires a hardware change for most older WLAN equipment.

"We just don't feel that the TKIP protocol cuts the grade for government encryption," Burr says. He adds that the RC4 encryption algorithm is not a Federal Information Processing (FIPS) standard and probably won't ever be because network professionals see RC4 as rather weak in terms of message authentication and integrity.

NIST is more inclined to approve AES for WLAN security, and in fact Burr pointed to

the NIST document 800-38C, published last summer, for encryption that includes the AES algorithm.

As far as the key management scheme for key exchange and setup is concerned, NIST might introduce a new key-management technology that's been jointly developed with the National Security Agency.

"We have to make the decision soon," says Burr, who notes that vendors that make WLAN equipment and their customers in the federal agencies are awaiting NIST's determinations.

"Right now, there's a lot of pressure on to get this worked out since the agencies want to buy wireless networks and the vendors very much want them to," he says. Because NIST's recommendations are binding as a purchasing requirement, sev-

Short Takes

■ Rivals **AEP Systems** and **Netilla** have merged to form **AEP Networks** in the hope of gaining enough business to survive the shakeout among SSL remote-access vendors. AEP's CEO Pat Donnellan will continue as CEO of the merged company, and Netilla's CEO will become its executive vice president. AEP took on $5 million more in venture capital money from its existing investors. Both AEP and Netilla were running on venture money, but say their combined customers and distribution networks will generate enough revenue to put the combined business in the black.

■ The number of cybersecurity professionals is projected to grow at an annual compound rate of nearly 14% from now until 2008, according to a November 2004 study. **"The Information Security Workforce Study,"** conducted by IDC for the International Information Systems Security Certification Consortium, projects that the number of information security professionals worldwide will be 2.1 million in 2008, up from 1.3 million currently. The survey of 5,371 full-time information security professionals in 80 countries found that 97% of respondents had moderate to very high expectations for career growth. Security professionals also have experienced growth in job prospects, career advancement, higher base salaries and salary premiums for certification at faster rates than other areas.

InSite: Lessons from leading users

Texas A&M probes traffic for assaults, faults

■ BY JOHN COX
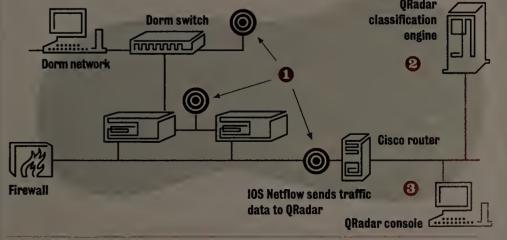
Texas A&M University has improved the network management and security for its sprawling wireless and wired campus network with an application that sifts through traffic for abnormalities or irregularities.

By identifying patterns and dissecting them, the application, named QRadar, gives the university's network managers a clear view of what's really happening for all devices and protocols on the network. The software lets operations staff quickly detect worms, peer-to-peer traffic, port scans, and other signs of both cyberattacks and equipment malfunctions.

Getting that level of detail across an entire network is difficult without software like this, according to Willis Marti, associate director of computing for Texas A&M in College Station. "Other tools are

Network radar screen at Texas A&M

Texas A&M uses software company Q1's QRadar application to gather every detail about its extensive campus network traffic. The software lets operations staff quickly detect worm attacks, peer-to-peer traffic problems, port scans and other signs of trouble.

❶ QFlow collectors connect to network device.

❷ Server program receives collector data, analyzes it and flags abnormalities. Cisco's IOS Netflow application also sends other net-related traffic information to QRadar application.

❸ Console shows alerts and lets managers drill down for details about traffic abnormalities.

Extreme switch packs speed, reliability

■ BY PHIL HOCHMUTH

Extreme Networks this week is expected to launch new switch chassis aimed at letting users link wiring closets directly to the LAN core via 10G Ethernet, while providing low latency and five-nines connectivity for IP phones, PCs and other network devices at the LAN edge.

The Aspen 8800 switch series could help businesses deploy IP telephony, Gigabit to the desktop and Wi-Fi access points with high-density 10/100/1000M bit/sec blades and Power over Ethernet (PoE) on each port. The boxes are part of a new LAN architecture Extreme is pushing, in which edge chassis link to a core switch via 10G Ethernet and use carrier-based technology for providing SONET-comparable failover capabilities. Extreme says this approach reduces switches on a network by eliminating aggregation layer boxes while making connections faster and easier to manage.

The Aspen switches come in 10- and six-slot configurations. Line cards support up to 48 ports of 10/100/1000M bit/sec Ethernet and PoE. A four-port 10G Ethernet blade is also available. Aspen is the second product line to run Extreme's XOS switch operating system — a modular, Unix-based operating system — introduced on its BlackDiamond 10K switch last year.

The Aspen boxes also support Extreme's Ethernet Automatic Protection Switching (EAPS) protocol, a Layer 2 switching technol-

ogy developed for metropolitan Ethernet service provider networks. EAPS lets Ethernet switches be configured in a ring, similar to SONET networks, and allows for failover of a link in 50 millisec (the same time it takes a SONET network to reconfigure a link).

Five Aspen switches will be installed in wiring closets in a new corporate facility at Luxottica Retail in Cincinnati, which operates LensCrafters, Sunglass Hut and Luxottica stores in the U.S. The boxes will support PC, IP telephone and wireless endpoints for up to 600 employees, says Stephen Bosch, the company's enterprise architect.
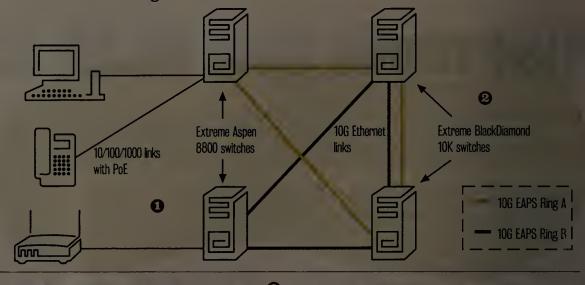
Luxottica Retail plans to install Aspen switches at the edge, with dual-homed Gigabit Ethernet connections to two Extreme BlackDiamond switches in the core. EAPS will create a virtual ring among each Aspen, and the two core boxes. Six hundred Avaya IP phones will run on the flat, Layer 2 LAN segment with Avaya IP PBXs only two hops away, attached to Extreme BlackDiamond switches in the core. Other applications will run on the company's Layer 3 LAN segments.

"Having all voice on a that flat EAPS network will let us segment and isolate that traffic and ensure it gets the highest QoS," Bosch says.

The Aspen switches support

Extreme's LAN revamp

With its Aspen 8800 series chassis, Extreme says customers can build simpler, more reliable LANs with less gear.

Extreme Aspen 8800 switches · 10G Ethernet links · Extreme BlackDiamond 10K switches · 10/100/1000 links with PoE

10G EAPS Ring A
10G EAPS Ring B

❶ Forty-eight- and 24-port blades in Aspen chassis can support 10/100/1000 and PoE links. Four-port 10G modules let customers link switches directly to the backbone.

❷ Extreme's Ethernet Automatic Protection Switching protocol lets edge and core switches be configured in Ethernet rings, similar to SONET, with sub-50-millisec failover in case of cable or switch failure.

several security and authentication features and standards, including 802.1x and media access control authentication, which lets administrators track what clients, either wired or wireless, can gain access through a switch port.

The switches also can apply network policies to multiple devices trying to access the network through one port.

Extreme also says a mix of hardware and software features can let

an Aspen 8800 series switch run with only 5.26 minutes of downtime over a year — the vaunted five-nines. The modules include redundant power supplies, fans and dual management/switch fabric modules, which provide instant failover, according to Varun Nagaraj, Extreme's vice president of product management.

The Aspen 8800 will compete with wiring closet chassis switches, such as 3Com's Switch 4007, HP's 5300 series, Cisco's

Catalyst 6509, Nortel's Passport 8300 and Foundry Networks' Fast-Iron chassis.

The Aspen 8800 series switches and line cards are available now. The 10-slot Aspen 8810 starts at $7,000 for the chassis, while the six-slot 8806 starts at $3,500. The 10/100/1000M bit/sec PoE ports cost $350 per port, and 10G Ethernet ports cost $3,500 each, without optical port modules. (Optics range from $4,000 to $10,000 per port.) ■

NIST

eral agencies are holding back from WLAN deployments until they hear from NIST.

"The Department of Agriculture, of instance, is trying to get out a policy for the entire agency for what they should do for wireless networks," Burr says. He adds that the department doesn't want to buy something that might have to be changed after NIST issues its determinations.

The goal is to have WLAN security guidelines in place soon for the NIST-certified independent testing labs that run test evaluations for a range of network equipment under the FIPS review process. ■

Site: Lessons from Leading Users

Texas A&M

too narrowly focused. They're either vendor-specific or protocol-specific," Willis says.

The software, from Q1 Labs, is marketed as a tool for creating a network security overview by surveying and displaying network behavior and traffic patterns as they take place. Texas A&M uses Version 3.0, released last May. In November, Q1 Labs released Version 4.0, which has been reworked to easily accept new mini-programs to add specific features. The first of these is QRadar-ICX (for Isolate, Contain and eXtinguish), which is designed to start countermeasures to block threats such as a denial-of-service attack, port scan or a rogue wireless LAN (WLAN) access point.

The university's network, which uses primarily Cisco and Alcatel gear, is huge, covering what Marti says is the geographically largest U.S. campus, including more than 200 buildings, an airport and a rail line. There are 45,000 students, 16,000 faculty and staff members, and 60,000 end-user ports, of which about 38,000 are active at any time. About 58% of the net is 100M bit/sec switched Ethernet. About 300 WLAN access points give wireless coverage in selected public areas.

All this makes for a natural focus on security.

"We force users to use a VPN and authenticate" before gaining access, Marti says. Rounding out the security framework are:
● Cisco VPN servers.
● A campus Lightweight Directory Access Protocol server for authentication.
● A distributed intrusion-detec-

tion system from SourceFire.
● An in-house program called NetSquid to block infected hosts.
● At the border, a homegrown packet-based firewall dubbed "Drawbridge."

To get a view of his network's activity, Marti used an open source tool, Multi Router Traffic Grapher, which collects data via SNMP requests to routers and other network hardware, and generates graphs of network utilization as Web pages.

"But we didn't have anything that could synthesize a picture of everything" on the network, Marti says.

QRadar creates that overview by gathering traffic data via sensors called QFlow Collectors (or via Cisco IOS' NetFlow), funneling it to the QRadar Classification Engine on a server, where it can be viewed via the QRadar Console application on a PC. The

collectors can use a network tap or attach to a mirrored port on a switch or router.

"It can't look at every link in every place," Marti says. "We have it look at our residence halls, the campus [network] border and our remote-access connections."

The server software creates a baseline of normal or customary network behavior. For example, the business office typically might have lots of SQL queries to a database. If an FTP file transfer mars that pattern, QRadar flags that event and sends an alert to administrators.

Network administrators can configure the Classification Engine with a set of rules reflecting their specific knowledge of, in this case, the university's network. "You can set up a rule that says 'a lot of IRC traffic out of a given subnet is an anomaly,'" Marti says. ■

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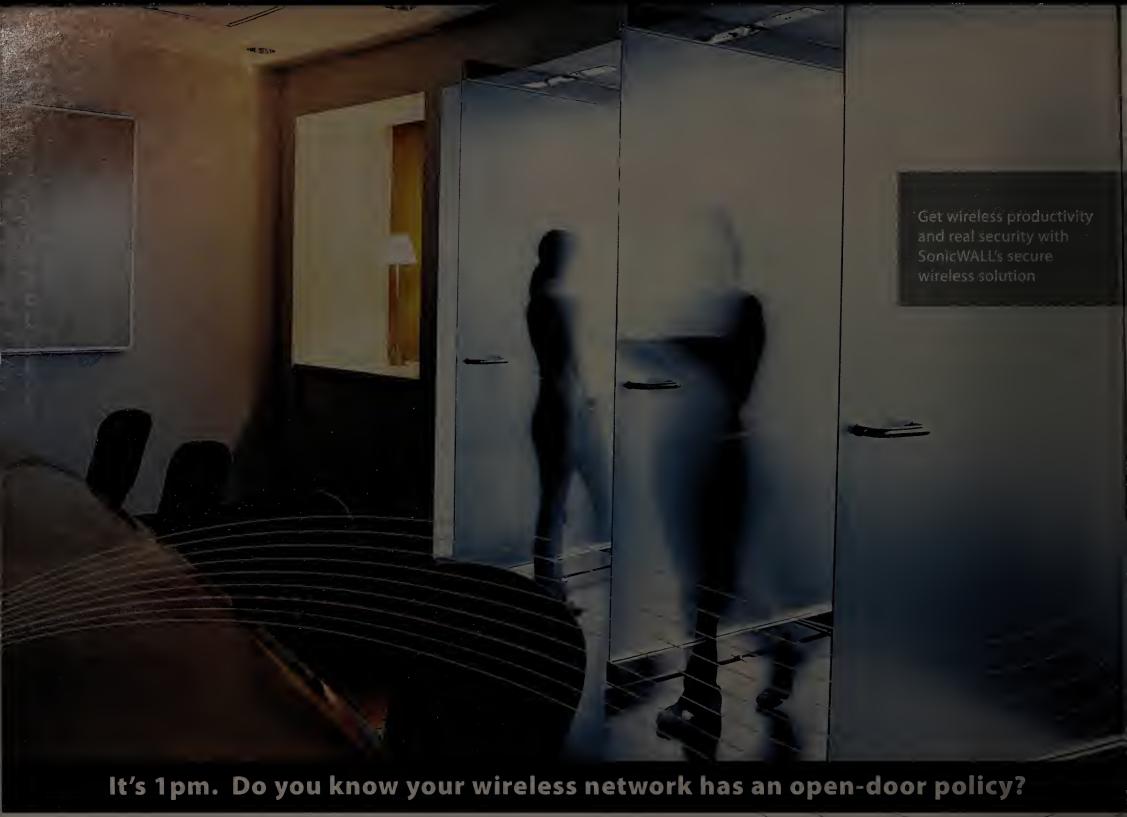
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Users, firms at odds on mobile devices

■ BY STEPHEN LAWSON

Companies and their employees might find themselves in a tug of war over enterprise-class mobile phones, an emerging set of devices that can run multimedia entertainment, games and business applications.

With these high-function handhelds,

Short Takes

■ Facing tough competition from IBM, HP and Dell, blade server pioneer **RLX Technologies** is exiting the hardware business to focus exclusively on marketing its Control Tower management software. The company has announced that it would stop selling blade servers and instead work on offering Control Tower for all major blade and server platforms. RLX released the sixth generation of Control Tower last year to accolades from analysts, who say the software is more sophisticated than what vendors such as HP and IBM offer. RLX says it will continue to provide hardware support for current customers.

■ After years of holding meetings with analysts and media at rival Intel's biannual developer conferences, **Advanced Micro Devices** plans to host its own developer conference this year. A source close to AMD says it would take place in the second quarter, right around the time that Microsoft is expected to finally release a 64-bit production version of Windows that works with AMD's 64-bit desktop processors. A report about the conference first appeared on The Inquirer, a technology news Web site. AMD is eyeing Las Vegas and Phoenix as potential conference sites, the source says. "It's something we're interested in doing, but it's something we haven't announced officially. The time is right," says Mike Simonoff, an AMD spokesman. He declined to comment on potential dates or locations.

companies finally have a platform that's fully mobile, almost always connected and powerful enough to use for applications that certain employees need on the road, such as salesforce automation and CRM. But IT executives are bracing themselves for future threats, including attacks that might come through consumer applications. At the same time, businesses are seeking ways to keep the cost of personal phone use out of their expenses and some service providers are responding (see related story, below).

"There's no device that's in worse shape in terms of manageability than a smart phone because for years [the cell phone] has been a personal device," says Gartner analyst Ken Dulaney.

Examples of enterprise network-oriented devices include the Nokia 6820 smart phone and 9300 wireless phone-PDA, the palmOne Treo 650, the Siemens SK65 and SX66, Motorola's MPX and Research In Motion's voice-equipped wireless PDAs.

In September, IDC forecast converged phone and data devices to outsell ordinary handheld data devices both worldwide and in the U.S. For 2004, it projected sales of 17.7 million converged devices worldwide and 4.8 million in the U.S., compared with 9.4 million data handhelds worldwide and 3.6 million in the U.S. Nearly 15% of those converged devices would go to enterprise accounts, IDC said.

At October's CTIA Wireless IT & Entertainment trade show, where vendors and operators promised nonstop fun for consumers in the form of games, photo sharing, video, custom ring tones and other applications and content, service providers also pushed the new devices as business tools.

Business applications should start hitting smart phones in vertical industries in the first half of 2005 and in general corporations in the second half, according to David Hayden, co-founder, president and CEO of consultancy MobileWeek. Consumer use of advanced data services is just getting started. Probably less than 10% of users are buying games or exchanging photos over the air, he says.

"Most people don't download and most people don't even use the picture messaging," Hayden says.

The potential benefits of mobile devices are clear to Steve Philpott, president of Bearing Belt Chain, an industrial equipment distributor in Las Vegas, who has replaced three sales representatives' conventional PDAs with palmOne Treo 650 phone-PDAs. He plans to get five more Treos. With the old PDAs, salespeople had to synchronize data with their office PCs before they went on the road. With the Treos, they can change plans in the middle of a trip and still have a chance to synchronize all the data they need, which also is more up to date, Philpott says. A side benefit to the combination device is that there is one less thing for an employee to misplace, he says.

But companies are embracing the new

Carriers increase companies' control over handhelds

Some mobile operators already have some offerings in place to deal with the conflict over enterprise-class mobile phones.

Verizon Wireless offers software tools that let a company configure its phones to accept only certain applications, says James Straight, vice president of wireless data products and business development. Verizon can produce two different monthly bills for one phone, one for corporate use and the other for consumer use.

Vodafone Group, which has extensive operations in Europe and the Asia-Pacific region, takes a less-detailed approach. If a company doesn't want its employees to use the Vodafone Live consumer multimedia service, Vodafone can lock the phone out of that service, says Peters Suh, a director of corporate strategy. The carrier also offers a managed service that tracks phone use and reports to the company any use for non-work purposes, he says.

Nextel Communications has geared up for dual use in several ways, says Senior Vice President Greg Santoro. Any Nextel phone can support two lines, so employees can set up a personal line and receive a separate bill that the employer never sees, he says. If they have just one line, they can set up an electronic wallet backed by a personal credit card.

To control what employees put on the phone, Nextel can set up a special download library of company-approved items. Currently that library can accommodate only applica-

tions, but Nextel soon will enhance it to offer music, graphics and other items, Santoro says.

At CTIA, Sprint, which agreed last month to merge with Nextel, introduced a managed service for companies that want to centralize control of their phones.

Under the managed service, Sprint can monitor the use and security of a particular employee's phone and determine what applications and content are on it, says Scott Boehmer, general manager of customer solutions. The carrier even can delete unwanted items. If a particular file or virus seems to be causing a problem, Sprint can search and delete it. Sprint is working on being able to find viruses proactively and remove them, Boehmer says. If a device is lost or stolen, Sprint can remotely delete everything on it.

Sprint's service is provided, in part, with Intellisync's Mobility Suite software. Sybase's iAnywhere Solutions unit also offers a product for managing remote devices, called XcelleNet Afaria Security Manager.

Afaria can remotely detect what applications are installed on a device and how much memory they take up, says Shari Freeman, a manager in iAnywhere's product management group. If the IT staff determines that a consumer application or content takes up too much memory or might be causing a conflict, Afaria can uninstall that item from the device, she says. Afaria also can encrypt the data on a device and wipe it out if the device is lost or stolen.

— Stephen Lawson

WIRED WINDOWS
Dave Kearns

Taking a look at the year ahead

Welcome to 2005! Because nothing of major importance tends to happen over the year-end holidays, this first-of-the-year column traditionally is given over to predictions for the year to come. First, let's look back at last year's predictions to see how well I did. There were five:

1. Microsoft will step up activity on the legal front.

It did, but I thought it'd be involved in more litigation. Instead, it's done its best to put legal problems behind it (for example, settlements with Sun and Novell). I claim half-credit as obviously the polarity of my crystal ball was reversed.

2. Expect huge losses and major changes in management and direction at The SCO Group.

Another partial credit. The huge losses have certainly occurred — it's doubtful it could last another year at the current pace unless there's a huge infusion of cash from somewhere. Not only is management going to be looking for a place to land soon, but the entire company could simply disappear.

3. Linux will become firmly entrenched in the enterprise server room.

The open source operating system has gotten a toe hold in the server room and is making steady progress. It might be too early to say "entrenched," but I'll give myself credit anyway.

4. Privacy and user control of their own data will be the major topics.

I might have been premature here, as regulatory compliance continues to be the driving force for identity management projects. But privacy and user control have gotten the lion's share of discussion around the virtual water cooler.

5. I saw 2004 as being the biggest year yet for politics and the Internet.

Nailed that one, didn't I?

Final score, approximately 3.67 out of 5.

Now, my fearless forecast for 2005:

Novell's Open Enterprise Server will surpass sales expectations. But a few minor but nagging problems will keep it from being a total success.

Microsoft, with no new operating systems due, will hammer heavily on licensing issues (looking very much like subscriptions) to try to even out the revenue stream.

As the economy picks up, so too will merger and acquisition activity, especially in the identity management market. Look for a half-dozen well-known companies to be assimilated this year.

Linux on the desktop finally will become a reasonable alternative to Windows for mainline business organizations.

We'll check back in a year to see how well I've done.

Kearns, a former network administrator, is a freelance writer and consultant in Silicon Valley. He can be reached at wired@vquill.com.

Mobile

devices cautiously.

Northwestern Mutual, an insurance and financial company in Milwaukee, gives employees only simple mobile phones and works with the service provider to prevent all uses except for voice, says Phil Zwieg, vice president of IS at Northwestern. The company is looking at adopting combination devices for e-mail and voice, but there are hurdles to overcome, such as security, Zwieg says. He has been particularly disturbed by recent reports of cell phone viruses. Northwestern won't introduce such devices until it understands the security mechanisms it needs to put in place, he says.

The director of telecom at a large U.S. chemical company, who asked not to be named, likewise still is studying the deployment of data-capable phones. His team is considering what applications need to be provided on mobile devices. E-mail and Web browsing for executives, plus access to management systems for technical support staff, are among the possibilities, he says. He's looking for a high-performance device with substantial storage, which raises potential problems.

"A phone is carried everywhere, whereas a laptop that an employee takes home, stays at home," the telecom director says. Top concerns include proprietary information getting into the wrong hands and possible misuse of stolen company information that would put its name in a bad light, he says.

An enterprise-class phone might hold sensitive business contacts, and inventory and sales information, says Bob Egan, president of consultancy Mobile Competency. An employee who uses that phone at a consumer Web site might put that data at risk, he says.

"One minute they're doing something in a very sanitized company environment, and the next, they're in a consumer environment," he says. Operators of Web sites often haven't looked at potential risks when translating them from conventional Web pages to ones for mobile devices, Egan says. He says dangers, such as viruses, data theft and denial-of-service attacks will be bigger on phones than they are on PCs because phones are more often connected and there are more of them.

Many of these devices also could give interlopers a way into a secure enterprise network through VPNs, Gartner's Dulaney says.

To maintain control, companies are taking a hard line, starting with corporate policies, and want more tools to do so.

Bearing Belt forbids employees to use company phones for personal calls, makes them sign a contract to that effect and audits their phone bills, Philpott says.

The chemical company telecom director expects employees to use the phones as personal devices sometimes, within policies, but he wants to apply the same rules to phone use that are in place for PCs. This includes a policy against downloading anything to the device itself, so employees have to keep any personal content on removable storage. He also wants itemized bills in order to break out personal use. Another measure would be the ability to erase or encrypt all the data on a device remotely in case it is lost or stolen.

Dulaney sees mobile device management moving in that direction.

"The company will have to own it, and as such, they'll build an image for it, and they'll manage that image," Dulaney says.

Lawson is a correspondent with the IDG News Service.

Apple delivers SAN system

■ **BY DENI CONNOR**

Apple announced last week that it has shipped a new file system and an upgraded server.

The Xsan storage-area network (SAN) file system lets users deploy a shared data environment for their data center or high-performance computing environments.

Xsan is a 64-bit clustered file system for Mac OS X that consolidates storage resources into one shared environment, and gives multiple computers read/write access to shared volumes in a Fibre Channel SAN.

Xsan administrative software provides volume management, configuration and remote monitoring. Administrators can set quotas for users with the Xsan administrative tool. Xsan can be used in Windows, Unix and Linux environments when deployed with ADIC's StorNext File System.

Xsan starts at $999 per client and server.

The company also upgraded its Xserve server, adding a faster processor and more storage. The 2.3-GHz dual-processor Xserve G5 offers 35 gigaflops of processing in a 1U-high box. It has as many as three 400G-byte drives for a total of 1.2T bytes of storage. The upgraded G5 also offers as much as 8G bytes of memory and two 64-bit PCI-X slots.

The Xserve G5 ships in three configurations: a single 2.0-GHz processor with 1G byte of RAM and an 80G-byte drive costs $3,000; a dual-processor 2.3-GHz model with 1G byte of memory and an 80G-byte drive costs $4,000; and a cluster-optimized Xserve with two 2.3-GHz processors, 512M bytes of memory and an 80G-byte hard drive costs $3,000. ■

Apple's Xserve G5 server boasts a faster processor and more storage than the earlier version.

PalmOne's Treo is among a new breed of device that serves as a phone and PDA.

Wireless GigE and AutoTracking Makes Canobeam DT-130 The "Perfect Solution."

"We chose Canobeam for its active optical (AutoTracking) connection. The four-lane highway ruled out a fiber link, but Canobeam Free Space Optics was the perfect solution."

STEVE GLENNON
SYSTEM ADMINISTRATOR, STRATASYS, INC.

✔ **WIRELESS GigE**
✔ **AUTOTRACKING**

(Above)
DT-130 photograph courtesy of Canon FSO integrator System Support Solutions, Inc., Orono, MN.

When Stratasys—a high-tech leader in rapid prototyping—needed to expand, a four-lane highway separating them from their new building prevented the use of fiber optics to network their data. Their solution was Free Space Optics and the brand they chose was Canon. Canon's Canobeam DT-100 Series, with built-in AutoTracking, enabled Stratasys to faithfully transmit complex computer data three quarters of a mile away to their rapid prototyping machines, which transform 3-D graphic designs into solid models.

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E-billing adopters find rewards

■ BY ANN BEDNARZ

For a company switching from paper to electronic invoicing methods, one obvious savings potential is mailing costs — no more bills to print or postage to purchase.

But there are a lot more savings to be gleaned by going electronic, users say. For Health Alliance Medical Plans in Urbana, Ill., a key savings comes from expedited dispute management processes.

Because Health Alliance bills its corporate customers in advance, accurate invoices are a rarity. Typically, corporate customers have a change to report — an employee to add to or remove from their health plan coverage, for example.

Within Health Alliance, reconciling these changes used to be a manual, time-consuming process. "In the past, companies would write in or cross out people on their paper bill," says Traci Kleinert, director of billing, enrollment and cash services at the

benefits provider. Inside Health Alliance, the accounts receivable department would log that information and pass it along to the benefits eligibility department for manual processing.

"It's those hand-offs that caused so much time delays — when multiple depart-

ments wound up having to pass around information," Kleinert says.

Today, account reconciliation is done online, thanks to Avolent's BizCast suite. The software aggregates eligibility, billing history and account status information from Health Alliance's back-end claims and gives customers online access to the data so they can modify rosters, approve invoices and resolve disputes online.

With BizCast, Health Alliance has cut back on billing costs, reduced billing-related calls to its customer service agents, and accelerated the payment process.

It puts customers in charge of reconciliations, Kleinert says. Customers can add members to their invoices, pay for those members online and drop members from their invoices. The software adjusts invoice totals as employees are added or dropped, and customers can pay the adjusted total. "We're able to see what they paid, and why they paid it," Kleinert says.

On the postage and printing front, BizCast also saves Health Alliance money — particularly given the size of the company's old paper bills. "The bills that we sent out, they're not one or two pages, they're 20 or 30 pages," Kleinert says.

Staging a comeback

BizCast is an example of e-billing software, more formally known as electronic invoice presentment and payment (EIPP) technology. EIPP products automate the invoicing and payment process with Web-based tools for delivering bills, moving cash and reconciling accounts among business trading partners.

It's not a new market: E-billing startups were a darling of the Internet bubble until the burst put several out of business or on the acquisition block. Since then, it hasn't

E-billing gains

Health Alliance Medical Plans expects to achieve big savings in its first year using Avolent's BizCast software. Here are some specifics from an early ROI tabulation.

Expense	Cost before BizCast	Cost with BizCast	First-year savings
Reconciliation and dispute process	$376,000	$188,000	$188,000 or 50%
Paper bill presentment	$55,000	$14,000	$41,000 or 75%
Manual check processing	$57,000	$43,000	$14,000 or 25%

Microsoft scrubs security component for Exchange

■ BY JOHN FONTANA

Microsoft has shelved a new security component for Exchange Server 2003. Instead, it will add its piece parts to a service pack and the next upgrade of the server.

Exchange Edge Services, first introduced in February 2004, is a message transfer agent (MTA) that can run at the edge of a network to provide customers with anti-spam, anti-virus and other messaging hygiene and policy-based features. Edge Services was intended to replace the current message transfer agent in Exchange, which has a dependency on Microsoft's Internet Information Server and Active Directory. The configuration can lead to open ports on the edge of networks that pose security risks.

Edge Services was to provide routing features and serve as a hub to plug in third-party e-mail security products from the likes of partners Network Associates, Sybari, Symantec and Trend Micro. It was also designed as a small cog in Microsoft's Dynamic Systems Initiative, a common management platform for Windows

servers and desktops.

In May 2004, Microsoft said it would ship Edge Services in early 2005, but in November 2004, the company hinted that the date was in doubt. In late December, Microsoft confirmed that Edge Services would not ship as a separate product, and that some of its features would be integrated into Exchange 2003 Service Pack 2, due in the second half of this year, and the next release of Exchange. A ship date for the next version of Exchange has not been announced. Last year Microsoft removed the long-awaited Kodiak release from its road map.

Edge Services also featured support for the SenderID framework, a sender authentication mechanism that was on track for standardization but crumbled late last year within the Internet Engineering Task Force. Problems with SenderID, which is now being revised, may have had something to do with the delay of Edge Services, analysts say.

"If Microsoft could not release Edge Services with some sort of authentication system, then that would have [eliminated]

Predictions with the world in mind

The editors asked us columnists to focus our first column of the new year on our predictions for the future of the corner of IT that we each cover. For me, that would normally entail a bunch of flip and/or sarcastic observations of current corporate technological assumptions and the technical realities that will stress those assumptions in the next year or two. But I found it hard to be flip in light of the earthquake and resulting tsunamis in South Asia that ended 2004, so I'll do the best I can.

My first prediction is that corporations, at least outwardly, will continue to ignore the world around them. A quick and decidedly non-scientific survey of a number of the Fortune 500 corpora-tions' Web sites shows that, for most of them, it's business as usual. Only a few, including Microsoft, Wal-Mart and Dell, bothered to acknowledge the South Asian disaster and include links to relief organizations. Only one that I found, Apple Computer, took almost all business content off its home page to focus on how people can help.

On the positive side, I only found one site, (ITT Industries), that exploited the events to high-light its own products (with no link for donations).

For what it's worth, I think a cor-poration that's not a member of its community is not living up to its responsibilities.

Speaking of the 'Net, 2004 showed its power in political (and humanitarian) fundraising, in political discourse, in cor-porate and political whistle-blowing, in public investigation (say goodbye to Dan Rather). This power will only increase this year, and in the years to come. Corporations that attempt, as some did, to stifle Internet-based discussions of their failings rather than to focus on fixing them will suffer the fate of increased focus on the failings. Note to corporate PR people: Treat the inevitable "YourCompany-NameSucks. com" Web site as a resource to hear what your com-pany is doing wrong (so it can be fixed), not as a target for the legal team.

By some accounts 2004 was supposed to be the year of enterprise VoIP and of storage over IP. Neither quite took off in spite of the fact that in both cases, a full range of products is now available. I doubt that 2005 will prove to be the year either. I'm sure there will be a number of additional big, high-profile conversions to VoIP and that storage over IP (for example, iSCSI) will repre-sent a recognizable fraction of the mar-ket. But I expect it will be a few years before either will be the default path.

Based on an AOL report, maybe 2005 will be a year when spam reduces as an issue (no thanks to the CAN-SPAM act). It is possible that 2005 will see the aver-age rate at which Microsoft patches its software will start to exceed the average rate of new exploits, but I'm not holding my breath.

In any case, Internet governance efforts, user-hostile mergers, federal and state regulators, law enforcement demands, open source proliferation, and the forces of nature and man will ensure that 2005 will not be boring.

Disclaimer: Harvard is closing in on having had 400 chances to make annual predictions, but there has proven to be little science in its effort, and the above are mine, not the university's anyway.

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Billing

been easy for pure-play EIPP players to stay afloat, Gartner says. Many are on shaky ground. In fact, Gartner warns cor-porations to include safety clauses in con-tracts that will let them assume control of systems, data and intellectual property if their vendor goes out of business.

Nonetheless, Gartner describes today's EIPP market as nascent but growing. The research firm expects it will become a $500 million market by the end of 2010.

According to NACHA, an electronic pay-ments organization, more businesses and consumers use electronic payments than checks. The number of checks processed by the Federal Reserve decreased for the fourth consecutive year in 2003, dropping 4.7% to 15.8 billion checks. Meanwhile, the Federal Reserve's Commercial Automated Clearinghouse volume increased by 12.1% to 5.6 billion payments.

One vendor eyeing the business-to-busi-ness market is Siebel Systems. Just a few weeks ago, the CRM leader announced plans to acquire Edocs, extending Siebel's customer service platform to include account inquiry and bill management capabilities. Edocs was among the largest remaining independent EIPP players, which also include Avolent, Pitney Bowes and CheckFree. Many of the large ERP players, such as SAP, offer some EIPP func-tionality in their suites, as do procurement vendors, such as Ariba.

Getting the cash

Revenue management, like EIPP, is an offshoot of ERP. Whereas EIPP technolo-gies are focused on getting invoices sent and paid electronically, revenue manage-ment software is aimed at helping com-panies forecast and collect moneys owed.

Network Appliance is currently deploy-ing revenue and receivables management software from Aceva Technologies. The storage hardware maker in Sunnyvale, Calif., uses Aceva's technology to improve its collections processes — to automate cash forecasting and dispute resolution, for example.

Aceva's software integrates with Network Appliance's ERP system. It aggregates data such as customer quotes, invoice information, purchase orders, shipping data, payment histories and credit availability — information that typically is scattered among multi-ple applications.

Collections and credit personnel need that information to be readily available, so they can quickly make decisions about whether to release a new order or make a phone call to a customer. "Aceva consoli-dates it for us," says David Gondorf, world-wide credit and collections manager at Network Appliance.

Timing is critical, Gondorf says. Imagine a $1 million order gets put on hold because a customer account is past due. However, the check is in transit, and only a collector in Tokyo knows and has a ship-ping confirmation to prove it. If that infor-mation is logged in Aceva, the order can proceed without any obstacles.

In the past, ironing out payment status discrepancies could be an inefficient, time-consuming process filled with phone calls and e-mails among sales and collections staff. "Redundancy of ques-tions is a real frustration," Gondorf says.

Along with improving communications among its global offices, a key goal of Network Appliance is to reduce its days sales outstanding (DSO), a calculation of the time that elapses between when an order is invoiced and when it's actually paid.

"DSO calculation is becoming more and more important," Gondorf says. "Analysts on Wall Street now look very closely at the balance sheet to determine the validity and health of a company."

By paying more attention and establish-ing standard policies and procedures for collections — strategy that includes the purchase of the Aceva software — Network Appliance has reduced its DSO from in the 70s five years ago, to in the 50s today. Over the next six quarters, Gondorf hopes to get the company's DSO down to the mid-40s.

Collecting moneys faster, in turn, frees Network Appliance to invest more in R&D, facilities, and mergers and acquisi-tions, for example. Gondorf also has been able to improve his DSO forecasting, which helps investment teams make more informed decisions about what to do with incoming moneys. ∎

Exchange

one of the key reasons to buying Edge Services," says Peter Pawlak, an analyst with independent research firm Direc-tions on Microsoft. "I think Microsoft real-ized that just crating competitive products to other [MTAs] wasn't going to sell any more licenses."

On top of that, Microsoft already had anti-spam features in the form of its Intelligent Message Filter, an anti-spam tool released in Exchange 2003 Service Pack 1. The second version was slated for release in Edge Services.

A Microsoft spokeswoman says support for the SenderID framework will be included in Exchange 2003 Service Pack 2 and that message-policy technology from Edge Services will be included in the next release of Exchange.

"Customers said they needed help meet-ing regulatory compliance requirements, and that required additional development time," the spokeswoman says. "That placed the delivery date of Edge Services close to the release date of the next version of Exchange Server. In its current form, Edge

Services was not going to meet the needs of customers."

While Microsoft is now without a formal road map for Exchange, the company says it is working on enhancing calendaring features, e-mail life-cycle management, mobility improvements, Longhorn server and 64-bit support, and integration with Web services.

Microsoft is working hard to get users to migrate from older platforms. Late last year, the company extended fee-based custom support to users of Exchange 5.5 in an effort to support those users while they migrate. ∎

FCC set to auction more PCS licenses

■ BY DENISE PAPPALARDO

Wireless service providers later this month will begin bidding untold millions of dollars on spectrum that the FCC is set to sell in its third Personal Communication Services auction.

Although this auction is not expected to bring in the billions of dollars past FCC sales have generated, analysts say this spectrum is valuable to carriers looking to beef up capacity in heavily populated areas such as Cleveland, Denver and Los Angeles.

"It's an important auction," says Roger Entner, an analyst at The Yankee Group.

Service providers are keeping their plans close to the vest, but Entner says he expects large wireless service providers such as Cingular Wireless and Verizon Wireless to be active in bidding for licenses in the larger cities.

There are 242 PCS licenses in the 1850- to 1990-MHz band being auctioned. The spectrum is available in chunks of 10 MHz, 15 MHz and 30 MHz.

While some carriers will be able to move into new markets for the first time, the majority will look to improve service in cities where they already offer service, says Bob Egan, president of consulting firm Mobile Competency.

The FCC is in the process of qualifying bidders, which were required to make an upfront payment by Dec. 29. The amount of the payment is determined by a handful of factors, including number of licenses a bidder is interested in winning, geographic region those licenses cover and if the bidder previously defaulted on a federal loan. A 10-MHz license in Boston, for example, would require a higher upfront payment than a 10-MHz license in Worcester, Mass., because the population in Boston is higher.

Next week the FCC is expected to reveal all qualified bidders. Although 49 entities filed applications to participate in the auction, only 22 initially were accepted, primarily because the other applications were missing information. That number could grow if companies refiled their applications before the end of 2004.

It's more difficult to determine which carriers will bid because the FCC is using old auction rules that let only entrepreneurial companies bid on the most sought-after licenses in the most populated cities. This was to prevent capital-rich companies from dominating the auctions. So instead of directly bidding on a license, some of the largest wireless service providers have created or teamed up with smaller companies so they can bid on these Tier 1 assets. "The letter of the law is being observed, but the spirit is not," Entner says.

For example, Sprint is affiliated with Wirefree Partners III and Verizon Wireless is affiliated with Cellco Partnership. The largest wireless service providers aren't the only companies interested in this spectrum. Bidders include resellers such as AirGate PCS, a Sprint affiliate, and small incumbent local exchange carriers such as BPS Telephone Company.

The FCC held its first PCS auction about nine years ago, and the history of these

transactions has been rocky.

Most notoriously, NextWave Telecom bid $4.74 billion on spectrum in the FCC's 1996 auction. The firm defaulted on payments for those licenses and later filed for bankruptcy. The FCC then reposed the licenses and reauctioned them in 2003 for about $16 billion. But auction winners such as Verizon Wireless and Nextel never received those licenses. The U.S. Supreme Court later annulled that auction, stating the FCC overstepped its authority when it reposed the licenses from a company that filed for bankruptcy protection.

In a settlement deal last year NextWave retained a portion of the most lucrative licenses. In the same deal the company returned the majority of its licenses to the FCC. NextWave later sold many of its licenses to Cingular and Verizon Wireless as part of its restructuring plan.

Although the PCS spectrum being auctioned in two weeks is expected to improve service in certain markets, analysts say another auction is more interesting.

Late last year the FCC announced plans to auction off licenses in the 1710- through 1755-MHz and 2110- through 2155-MHz bands as early as June 2006. The FCC is calling these assets Advanced Wireless Services licenses, and they are designated for 3G services. The federal government currently uses the 1710- through 1755-MHz bands, and those users will be moved to another band before the auction.

Entner says the new spectrum bands will make high-speed, mobile wireless data services more widely available. But services in these bands are likely two years off. ∎

Gazing into the crystal ball

EYE ON THE CARRIERS
Johna Till Johnson

W hen it comes to characterizing the telecom market evolution over the past few years, Jerry Garcia and friends said it best: What a long, strange trip it's been.

Hold on to your hats, friends, because it's about to get stranger still. A glimpse into the crystal ball for 2005 reveals several significant trends. Think wireless. Convergence. And the ongoing cluelessness of regulators (some things never change).

Here are my predictions for the year ahead:

1. The telecom sector rebounds. We're not talking about a repeat of the 1990s frenzy — think steady, incremental growth. But all signs are positive: Network managers consistently say they anticipate significant bandwidth growth over the next 12 to 18 months, typically 50% to 100%. That's good news for most major service providers (except MCI, see below) and the infrastructure players that sell to them (Cisco, Juniper, Nortel and Lucent).

2. Wireless broadband emerges. Forget fiber. The future of broadband local access is wireless. But which one? The ultimate winner might be 802.16 WiMAX, high-speed packet download access, 802.20 Mobile Broadband Wireless Access, 802.22 or some other flavor. It's too soon to call (that'll be the topic of a future column). Look for services to roll out in the U.S., Europe and Asia starting this year. We're just at the beginning of the technology hype cycle, so the rollout will be followed by the

inevitable bashing and fierce standards wars. But make no mistake: Wireless broadband is here at last.

3. MCI goes out of business. OK, not really — you network managers at Carlson Companies, Nestle, Mattel and the other big firms that signed with MCI in the past few months can chill, at least for a while. But despite a once-stellar customer list and world-leading technology, revenue continues to decline. More ominously, the company's legacy of cobbled-together networks keeps operational costs unnaturally high compared with the competition. Declining revenue plus high operational costs spells trouble. So while I believe MCI will survive the year in some form or other, its long-term prospects are bleak — despite the overall positive trends in the telecom sector mentioned above.

4. The FCC gets serious about regulating "Internet dial tone" (arrgh!). The folks in Washington have woken up and smelled the coffee — they finally recognize the irrevocable shift toward IP networks, and they're eager to swing into action and regulate the new technology as thoroughly (and ineffectively) as they did the old public switched telephone network.

5. Convergence gets bigger. Two years ago, if you were considering VoIP for your business, you had to justify it to your boss. These days, you have to justify a decision not to consider VoIP. Watch for the convergence juggernaut to continue gathering momentum.

And finally, for readers wondering what happened to the Eye on the Carrier 2004 Forecasting Report Card: Stay tuned. That'll run in the next issue.

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Net.Worker

■ PRODUCTS, SERVICES AND STRATEGIES
FOR TYING TELEWORKERS TO THE ENTERPRISE

Q & A   What's ahead for Vonage in 2005?

Cisco/Linksys touts residential IP telephony as the next big thing. A slew of broadband providers from AT&T to Cablevision jump on board to offer flat-rate phone services with compelling new features. What's it all mean for the upstart that started it all, Vonage Holdings? Network World's Net.Worker Managing Editor Toni Kistner discusses the company's plans for the new year with Vonage Chairman and CEO Jeffrey Citron.

Vonage partnered with Viseon in an exclusive deal to offer broadband videophone service. How will Vonage succeed with a product that's never taken off?

We're working with Viseon to solve the problems that have plagued videophones historically. One big concern has been pricing. Videophones have been terribly expensive, not really approachable below $500. The other problem is quality. There just hasn't been enough bandwidth. But conditions in the home have changed. Higher bandwidth is becoming more readily available, compression technologies more advanced. The quality of the phones is now very good, and finally we think we can bring down the price and make it affordable.

How will you bring down the price?

We'll be announcing pricing details soon. But the bigger question in the video telephony world is do people really want this. We think if it's affordable, they do. I guess we're going to find out.

What other hurdles exist for consumer adoption? Fewer than 800,000 VoIP consumer lines were installed in 2004, according to In-Stat/MDR. That's still relatively low.

Awareness: It took two decades before there was a cell phone in every household. It wasn't just price or service, it just took time to educate people. The good

news with residential VoIP is that the adoption rate is much faster. We're looking forward to a robust '05.

But isn't the nature of consumer broadband (typically asynchronous) a big barrier? Download speeds might be 1M or 2M bit/sec, but upload speeds are abysmal for video. 128K bit/sec, maybe 256K. Don't you need at least 512K bit/sec uploads for decent performance? If I get upload speeds of 128K bit/sec and buy your product, I'm going to hate it.

Well, 128K bit/sec would be a little challenging. Some consumers aren't even aware what their upload speeds are. That is an issue.

Is Vonage doing anything to spur service providers to offer higher upload speeds or synchronous service tailored to videoconferencing applications? Isn't the success of your product riding on this?

We do help by educating our customers about bandwidth. The good news is that the industry is moving the speeds up for both uploads and downloads, so this problem is sort of self-correcting. Even so, there is still a lot of old cable plant out there with low speeds, and some operators out there are slow to replace it. The cable guys are giving a lot more bandwidth. Many DSL providers are still running DSL 1, which has limitations.

With big name providers getting into the consumer IP telephony market, what's your strategy to gain market share?

My goal is to be the largest provider, so I have to grow my customer base faster than they do. So far Vonage has been able to do this, particularly in the fourth quarter [of 2004], even with Time Warner and Cablevision factored in.

What's in the company's future?

We don't anticipate being bought out. We're definitely in it for the long haul. We're making enormous investments in our technology, personnel and facilities to accommodate a long period of growth.

What are your goals for 2005?

To continue to increase the number of devices customers can use on our network. Initially, we offered one box from Cisco, then added one from Motorola.

Residential VoIP vaults

Between cable VoIP services and hosted SIP services from Vonage and others, the number of U.S. residential IP telephony lines is expected to surpass 9 million by 2008, according to In-Stat/MDR. Meanwhile, the number of small-business VoIP lines is expected to reach 1.7 million.

■ Residential cable VoIP subscribers
■ Residential hosted VoIP subscribers
■ Business users, combined cable and hosted

Year	Residential cable VoIP subscribers	Residential hosted VoIP subscribers	Business users, combined cable and hosted
2004	383,500	454,558	67,922
2005	747,500	1,035,300	182,700
2006	1,092,960	1,974,072	404,328
2007	1,799,280	3,812,688	780,912
2008	2,578,260	6,602,355	1,755,057

We have four different devices from Linksys, devices from Netgear, and we're adding videophones. We want to add newer kinds of devices from different manufacturers so customers can choose different ways to connect their communication system to our network. That means building our adapters into cable and DSL modems, routers, access points, media centers. We can offer a more holistic approach, where one box does everything, as well as a stackable approach, where you add this thing to something you already have. ■

Short Takes

■ **Vonage Holdings** has announced three partnerships that will let it extend its VoIP offerings. Vonage and **VTech** will develop a 5.8-GHz cordless phone system that plugs into a broad-

band modem or router, eliminating the need for a stand-alone adapter and phone. Vonage and **UTStarcom** will develop a portable 802.11b wireless handset. Both products are expected to ship in late spring. Vonage and **Viseon** plan to offer Viseon's Digital Home Telephone for VoIP, a broadband videophone with a cordless handset that has an integrated phone adapter

with WAN and PC ports so broadband connectivity can be shared without a router. Pricing hasn't been set.

■ **Linksys** has announced a media adapter that supports the digital rights standard DTCP-IP, which allows for the streaming of protected premium content from online services over home networks. **The Wireless-**

G Media Link uses Digital5's middleware to stream content to devices, and it will work with high-definition TVs and support HD content when available. Intel supports DTCP-IP, and Linksys recommends using an Intel Pentium 4 PC with Hyper-Threading Technology on the network. It is slated to ship in the spring. Pricing has not been set.

Technology update

Identified Internet Mail combats fraud

■ BY JIM FENTON

The proliferation of spam, e-mail fraud and messages with malicious attachments is a serious problem for businesses and consumers. While various e-mail filtering technologies can reduce the quantity of spam that finds its way to in-boxes, spam and virus senders still can disguise the true source of e-mail or make it appear as if messages came from entities the recipient trusts — such as a bank.
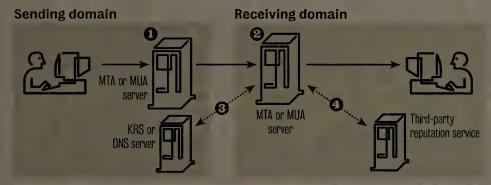
The Identified Internet Mail (IIM) specification was submitted to the IETF as an Internet draft in July 2004 and is under review. IIM provides new protection that can help stem the tide of unwanted and harmful e-mail. Compared with other signature-based approaches, IIM offers a more reliable way to authenticate messages and is designed to provide scalability for authorizing large numbers of public keys. IIM enables e-mail systems to confirm that a sender is authorized to send messages using a specific e-mail address and that the original message has not been altered by an unauthorized user.

In a typical IIM use, the sending e-mail domain's outgoing mail server, known formally as a mail transfer agent (MTA), "signs" the message by inserting a new header with the sending user's signature and the public key to be used to verify it. The key used for signing the message is one that has been authorized by the domain administrator for the specific e-mail address or for the entire e-mail domain. Alternatively, a mail user agent (MUA), software used by the message writer or reader, or mail submission agent, a type of MTA that authenticates the message sender, can sign the message.

■ HOW IT WORKS

Identified Internet Mail

IIM is an IETF proposal that allows a recipient or a recipient's organization to authenticate messages and verify their authorization.

Sending domain / **Receiving domain**

MTA or MUA server / KRS or DNS server / MTA or MUA server / Third-party reputation service

❶ The sender domain's mail transfer agent (MTA) or mail user agent (MUA) server signs a message and inserts a new header with the user's signature and the public key used to create it.

❷ The receiving domain's MTA or MUA verifies the legitimacy of the signature by checking the public key included in the signature header.

❸ The receiving MTA or MUA authenticates the key by querying a key registration server (KRS) or DNS server in the sending domain.

❹ IIM supports the use of optional third-party reputation services to make additional policy-based decisions on signed IIM messages.

At the recipient's domain, an MTA or MUA uses the public key included in the signature header to determine whether the sender's IIM signature is correct for the message. The server also queries the originating domain to determine whether the key matches that of an authorized sender. This query can be to DNS records published by the originating domain or to an HTTP-based server known as a key registration server, depending on the deployment needs of the originating domain. Based on the response, the message can be sent to the recipient or flagged as a possible fraudulent e-mail.

Keys used to sign messages can be authorized for an individual e-mail address or for all addresses in the domain.

The receiving MTA can attach an optional verification header that communicates the results of the verification process to the MUA. This lets the MUA in the receiving domain offload verification tasks to an MTA, thereby improving the timeliness of verification and requiring less change at the user's desktop.

Easy to implement, IIM mail signing is compatible with current e-mail infrastructures and client software. Signing and verification can be implemented by plug-ins to popular mail servers and client software.

Because IIM signing involves only the addition of a new message header, receiving domains that have not implemented IIM still can receive IIM-signed messages. And network managers can deploy IIM in a manner that lets a signed message pass verification if only insignificant changes, such as modifications to spacing or line breaks, have been made to the message.

With IIM, signing can occur at a gateway or at a mail client, which supports roaming users or those who use affinity domains that do not maintain their own MTAs. IIM messages also include a signed copy of selected message headers, which are often changed in transit. If a header has been modified, the receiving domain can replace the headers with those from the signature, alert the recipient or reject the message.

Once IIM has verified a message's origin, third-party reputation and accreditation services can be used to decide what additional policy-based actions to take on messages. For example, signed messages known to be from reliable domains could be white-listed to ensure that they are delivered to the recipient.

Using IIM, organizations will be able to detect when spammers, phishers and other fraudulent e-mail senders are disguising the true source of their messages. Companies that adopt this proposal will be better equipped to help ensure the safety of their networks, improve employee productivity and reduce expenses associated with eradicating unwanted e-mail.

Fenton is a Cisco Distinguished Engineer and the co-author of the IIM proposal. He can be reached at fenton@cisco.com.

Ask Dr. Internet By Steve Blass

Our three-PC network workgroup uses Internet Connection Sharing (ICS) to connect to the ISP using dial-up. A Windows 2000 PC is loaded with a PCI 56K bit/sec modem. When we select "on-demand dial" so the other PCs can dial out on it, a 15-character password overrides the correct saved password for the dial-up account, and no authentication occurs. It seems to be a local system account. How do I get the correct dial-up password to not change?

You say the ICS host fills in the wrong password when you choose "on-demand dial," so the first thing to try is to set the password on the logon account that you use on the ICS host to match the dial-up account password, and then see what happens when you try to connect from a client. Next, find out if your ICS host automatically logs on to some particular account at startup, and if that account has the same name and password as the dial-up account. Windows workgroup networking relies on shared account names and passwords among the workgroup computers. ICS relies on there being a network client active on the workgroup computers. The Microsoft Knowledge Base advice for ICS problems seems to be to uninstall ICS and then re-install for a fresh start.

Blass is a network architect at Change@Work in Houston. He can be reached at dr.internet@changeatwork.com.

GEARHEAD
INSIDE THE
NETWORK
MACHINE
Mark
Gibbs

Dealing with hot spots

Welcome to another year of Gearhead! As we start planning a strategy to shed our newly acquired padding we have a couple of neat products that arrived just before Christmas that you might find useful in the coming year should you look for or find yourself in a hot spot.

First, we have the WiFi Seeker from Chrysalis Development. This 2.25-by-1.2-by-0.43-inch key-chain device detects 802.11b and 802.11g signals at distances up to 300 feet. Press the button on the device and the four LEDs on the front will flash for about a half-second if there is a Wi Fi source within range. It then will display between one and four lights, depending on the signal strength.

Inside the case there is a tiny and fairly directional dipole antenna that makes the WiFi Seeker a useful access point locator. The WiFi Seeker is the best gadget we've come across for finding Wi-Fi hot spots and yours for around $25.

Our second product addresses a different hot spot issue that will be crucial to all male users of laptops who: a) actually use their laptops on their laps, and b) plan to sire children. The problem with many laptops is that when used on your lap, you might find you have a personal hot spot — in fact, some laptops get uncomfortably hot. Hence the second problem.

Now we are sure you are avid readers of the prestigious U.K. journal *Human Reproduction*. Thus, you must have seen in a recent issue the results of a study titled "Increase in Scrotal Temperature in Laptop Computer Users," by Dr. Yefim Sheynkin of the State University of New York at Stonybrook (for more details go to www.nwfusion.com, DocFinder: 5332).

The study involved a group of 29 men between the ages of 21 and 35. Sheynkin and his colleagues measured subjects', er, private temperature both with and without laptops in a room where the temperature was "about 71.6 degrees Fahrenheit." We would have preferred the temperature measured to at least two decimal places.

Apparently, when the gentlemen held their thighs together to balance a laptop that was not switched on, their lap temperatures rose by about 3 degrees. The scientists then switched on the laptops,

allowed the machines to warm up for 15 minutes and placed them on the subjects' laps. The gentlemens' temperatures rose by just more than 1 degree in 15 minutes.

Sheynkin said that because the body needs to maintain a proper testicular temperature for normal functioning, "portable computers in a laptop position produce scrotal hyperthermia by both the direct

der, "what can I do?" Simple, buy a $30 Laptop Desk from LapWorks (or APC's stand, below).

The Laptop Desks will not only reduce the risk of scrotal hyperthermia as proved by a thermal study conducted by the California Polytechnic University at Pomona (see details at DocFinder: 5333), they will also allow you to sit in a better posture.

The problem with many laptops is that when used on your lap, you might find you have a personal hot spot — in fact, some laptops get uncomfortably hot.

heating effect of the computer and the sitting position necessary to balance the computer." Do we need to point out that scrotal hyperthermia in men leads to decreased fertility? No, we do not.

After one hour of use, the surface temperature of the laptops rose from around 88 degrees to nearly 104 degrees, and for the gentlemen the temperature rise was on average 4 degrees on the left of the scrotum and 5 degrees on the right. Who could have guessed?

So all you laptop-using chaps planning to start families must be starting to won-

When not defending your lap, the Laptop Desks can be folded into a wedge shape that places the laptop's keyboard at a more ergonomic typing angle and improves non-lap-based cooling.

We tried the Laptop Desk Version 2.0 and the new Laptop Desk UltraLite that is thinner, lighter and designed specifically for road warriors using notebooks of 5 pounds or less. In both cases, our posture was much better and we were, shall we say, personally much cooler.

Hot tips to gearhead@gibbs.com.

Cool Tools | Solving Gearhead's 'hot spots'

Quick takes
on high-tech toys
By Keith Shaw

While Gearhead is off reading his prestigious journal, we have another answer that will cool down your personal "hot spots." The Ergonomic Mobile Computing Stand has the ability to reduce the risk of, as Gearhead says, scrotal hyperthermia and keep your laptop from overheating.

The scoop: Ergonomic Mobile Computing Stand and Optical Travel Mouse, from APC, about $50 ($30 for the stand, $20 for the mouse, sold separately).

What it does: The Ergonomic Mobile Computing Stand is basically a piece of plastic that you can put your notebook on to help cool the system (by raising it off the desk or other surface, airflow helps keep the system from getting too hot).

The stand includes rubber pads that keep the stand from slipping, an extendable mouse pad that pops out to provide a solid surface, and retractable legs that tilt the stand for use on a desk.

The Optical Travel Mouse is a two-button mini-mouse with a scroll wheel that has a retractable cable for easier storage.

Why it's cool: The device will please travelers who like to use their laptops while sitting on a hotel bed or in an

airport to alleviate what we prefer to call "hot leg" syndrome. The stand helps eliminate that effect and provide a more solid surface for the mouse. The retracting cable on the optical mouse, as well as the light weight of the notebook stand, make this a no-brainer to bring along on trips.

The price seems a bit high for a basic piece of plastic, but for road warriors concerned with their fertility, it's a small price to pay.

Grade: ★★★✦ (out of five)

The scoop: QL-500 Label Printer, from Brother, about $100.
What it does: The QL-500 connects to a PC via USB cable and included software lets you create labels, such as address labels, name tags or whatever else you can imagine that would work on a sticker.

The printer prints out labels one at a time, or you can print out multiple labels during one session. The system comes with its own label design software, or you can print labels directly from Word, Excel or Outlook. The compact printer supports many label styles (all sold separately), so items such as visitor badges, CD/DVD labels and other odd-shaped label sizes can be produced through the printer.

Why it's cool: With regular printers and sheets of labels, if you don't have a full list of addresses you waste the extra labels. With this printer, you print only the labels you need, nothing else is wasted.

Setup was easy, and the software is fun to play with (especially loading up clip art and creating fake labels).
Grade: ★★★✦

The scoop: 1.8-inch Combo Ion hard drive, 40G bytes,

from IOGear, about $350.

What it does: An "ultraportable" external hard drive, the Ion portable hard drive offers 40G bytes of storage and can connect to a PC or Macintosh over USB 2.0 connections or FireWire. The device includes a DC power adapter, back-up software (Dantz Retrospect), carrying case and a built-in belt clip so you can carry your hard drive with you.

Why it's cool: Transferring large batches of files was extremely easy with this device. We just plugged it in, attached the cable to our computer and the drive mounted as an additional drive (two separate volumes are preformatted for you).

This was useful in transferring all our music files from a Windows XP PC to a new Apple iBook G4 notebook because we could use the USB 2.0 cable on the PC and then switch to the FireWire cable for the Apple transfer.

We transferred 264M bytes in about 20 seconds, and the rest of the music collection (about 5G bytes) transferred in about 6 minutes. The ports were clearly labeled to let you know where cables went.

We also were impressed with the drive's size — carrying around 40G bytes of storage has never been easier or cooler to do, especially with the attached belt clip. Having USB 2.0 also helps immensely, as it's the difference between a 72-minute file transfer (over USB 1.1) and a 4-minute transfer.

Grade: ★★★★

Shaw can be reached at kshaw@nww.com.

APC's Ergonomic Mobile Computing Stand lets air flow under a laptop to help eliminate the "hot leg" syndrome.

IOGear's Combo Ion hard drive let us transfer 264M bytes from a PC to a notebook in about 20 seconds.

ON TECHNOLOGY
Network World Staff

Ten predictions for '05

opinions!

Last week we reviewed our 2004 predictions (we only got about 50% right this time around), and now it's time to turn our gaze on this new year.

● As companies use component architectures to build applications, operations headaches are beginning to emerge. The problem: Simple components are easy to build and easy to bolt into larger apps, but if the little pieces don't go through the usual quality checks the process can result in a house of cards. Look for companies to review core processes and reach for new tools.

● The utility computing vision will require standardizing on management tools from a single vendor, or a strategic set of five or fewer vendors with integrated wares. The big management guns — CA, BMC, HP and IBM — recognize that and went on an acquisition binge last year. Now they're teaming with players like Cisco. Expect more acquisitions and partnerships.

● An increasing awareness of the dangers of spyware will distinguish 2005 as the first year businesses make substantial purchases for desktop protection. Microsoft — which just acquired anti-spyware company Giant — will push into the market, while the anti-virus crowd, including McAfee and Trend Micro, will make more noise about their new protection tools.

● With 10G Ethernet prices coming down and bandwidth demands increasing, 10G Ethernet adoption will take off as companies replace Gigabit backbones installed four or five years ago. The emergence of 10G NICs for servers and storage systems also will spur adoption.

● LAN switches will take on more tasks as vendors integrate functions such as IDS, IPS, anti-virus, anti-spam and Wi-Fi. Also, look for new switch entrants touting innovative switch designs.

● Complying with Sarbanes-Oxley and other regulations has been painful and time-consuming. Companies are looking for ways to automate the compliance process. Look for new tools, even new vendors, to emerge.

● Consolidation comes in waves, so expect the recent Symantec/Veritas and Sprint/Nextel deals to create ripples in those, and adjacent, markets. Not all of the resulting activity will make sense.

● Huge VoIP deals were signed in 2004, and these won't backfire like some of the earlier deals (remember Merrill?). Look for more major contracts and the big carriers to roll out significant IP Centrex services.

● The open source movement got a boost from the success of FireFox last year. Look for that to ignite interest in still other open source applications. The movement isn't just about Linux any more.

● Wi-Fi is easy and handy, but shared 10M bits/sec pipes just don't cut it. Vendors are rolling out pre-802.11n 100M-plus bit/sec products, but early tools won't be interoperable and won't comply with the ultimate Wi-Fi standard, which isn't expected to be ratified for a few years. That won't stop the marketing machines.

Better billing needed

Regarding the story "Carriers jump into auditing" (www.nwfusion.com, DocFinder: 5323): It is almost laughable that carriers are trying to "sell" the customer an accurate invoice. An inaccurate bill is a breach of confidence between the customer and supplier that the supplier should work diligently to resolve. When the inaccuracy becomes the normal course of business for the supplier, it is simply unethical.

Telecom customers spend considerable time and money to uncover carrier-billing errors, so shouldn't the customer charge the vendor for the costs of incorrect bills? Carriers that are penalized for the errors would be motivated to issue correct invoices the first time. It surprises me that this has not turned into an issue for a state attorney general.

Some vendors have taken a "catch me if you can" approach to this problem. Gartner analyst Eric Goodness has observed that "12% to 20% of telecom charges are in error, and 85% of the errors are in the carrier's favor" (see DocFinder: 5324). His observation is consistent with my company's experience, but we also have noted that the 15% of the errors in our favor are trivial in actual dollars compared with the dollars in the carrier's favor.

One of my company's wireless vendors, which was mentioned in the story, begrudgingly issues us credits on every invoice — at a rate of hundreds of thousands of dollars per year — but only when we catch the errors. Although the errors this carrier makes are predictable, the carrier shows no intention of correcting the root causes. I can't bring myself to accept that they are going to "do better" when I subscribe to their

E-mail letters to jdix@nww.com or send them to John Dix, editor in chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.

correct invoicing.

Trusting the carriers to "find" the errors that they have failed to correct over the years is counterintuitive to me. Carriers simply need to issue correct invoices, minimizing the need for telecom auditing. If the vendors want to gain the trust of the companies they are supposed to service, accurate billing is a great place to start.

Eric Reibsane
Willow Grove, Pa.

Criminal motivation

I am happy to see more coverage of computer criminals and their motivations, such as your excellent collection of stories, "Profiling cybercrime: Network threats and defense strategies" (DocFinder 5325). We need to know our enemies in order to defend ourselves from them.

However, I doubt that any of your authors or quoted experts have ever interviewed or studied real, live cybercriminals. If they had, they might have guessed that the most common motivation is not money as stated in the story. I found that the most common motivation among the 200 cybercriminals that I have interviewed and studied starting in 1967 is attempting to solve intense, unsharable, personal problems. Sociologist Donald Cressey also reached this conclusion among 300 white-collar criminals that he interviewed in prisons.

This finding has made confidential personal problem-solving advisory services for employees and management one of the most important (and socially redeeming) network and computer security safeguards that I have recommended to most of the 250 clients that I have advised on security during the past 35 years.

Donn Parker
Certified Information Systems Security Professional
RedSiren
Los Altos, Calif.

USER VIEW
Chuck Yoke

DSL: The best (and worst) of times

From my recent experience, carrier-provided, business-class DSL appears to be an over-rated and overpriced service . . .

In *A Tale of Two Cities*, Charles Dickens famously describes life in 18th century Paris and London as "the best of times … the worst of times." Even though the similarities between 18th century Europe and 21st century America are few, my recent experiences with DSL also can be described as the best of times and the worst of times.

The worst of times has been my experience with carrier-provided, business-class symmetric DSL (SDSL). In order to provide a less costly connectivity option for smaller locations, my organization developed a VPN service that uses SDSL. We chose SDSL to provide a higher level of service than residential asymmetric DSL (ADSL) offers.

The SDSL service is provided through a national carrier. Many competitive local exchange carriers (CLEC) deliver the actual service, but the carrier manages the vendors. However, because the carrier does not own the DSL infrastructure, the service levels have been less that stellar.

All problems have to go through the carrier first, which extends the target mean time to repair (MTTR) to 48 hours (vs. the 24-hour target the CLEC provides). While 48 hours of downtime is bad enough, the 48 hours is allocated into eight-hour "chunks" Monday through Friday, thus increasing the target MTTR to six business days.

Granted, many problems are resolved much more quickly, but we have had multiple instances of outages lasting from six to 10 business days. The impact on the profit and loss of the affected locations has been significant and we are currently developing temporary dial-up solutions to avoid a catastrophic loss.

The carrier's inability to provide higher service levels has created an unforeseen risk to my company's revenue stream. This, combined with frustrated users, has made my experience with SDSL "the worst of times."

At the opposite end of the spectrum is my experience with LEC-provided residential ADSL. The LEC owns the entire infrastructure, including the local loop, and my service has been close to being the "best of times."

There were a few problems initially, but they mainly involved a newly retrofitted digital loop carrier in my subdivision and were resolved within 12 hours. After the first few weeks, my service has stabilized and I have not experienced any problems. And I am paying one-fourth the cost of business-class SDSL and getting twice the bandwidth.

From my recent experience, carrier-provided, business-class DSL appears to be an over-rated and overpriced service that does not bring the value to justify the added cost. The value of DSL — higher bandwidth at a lower cost — can best be offered by the LECs that own the entire infrastructure and can resolve problems in a timely manner. It might require working with multiple providers to get the coverage required, but it is worth the effort to have the best of times with DSL.

Yoke is director of business solutions engineering for a corporate network in Denver. He can be reached at ckyoke@yahoo.com.

ABOVE THE CLOUD
James Kobielus

Taming the XML beast

The industry momentum behind MTOM and XOP is strong.

XML is here to stay, having become the standard markup syntax for most new Web services protocols, formats and interfaces, such as Simple Object Access Protocol. The flood of XML on networks will continue to grow, whether or not IT professionals are prepared.

Traditionally, XML's biggest disadvantage has been its bloated, ASCII-text-based encoding, which requires that you send considerably more bits than in non-XML binary data transfers. Companies can't address XML's bandwidth consumption issues effectively without universal standards that describe how this content can be encoded in binary formats. Fortunately, the industry has made notable progress in this area.

One approach is to rely on various industry specifications that use an XML-based SOAP message as a manifest for describing binary data files within SOAP's surrounding HTTP packet. SOAP with Attachments (SwA) and Microsoft's Direct Internet Messaging Extensions (DIME) transmit opaque, non-textual data — such as images and digital signatures — along with an XML document. But they don't support binary encoding of all content within XML documents.

Neither SwA nor DIME has achieved broad adoption within the industry. Recognizing the critical need for a consensus standard for compact XML encodings, the World Wide Web Consortium (W3C) has developed new candidate recommendations for binary encoding of XML within SOAP 1.2 payloads: SOAP Message Transmission Optimization Mechanism (MTOM) and XML-binary Optimized Packaging (XOP). The W3C's XML Binary Characterization Working Group has released the first public working draft of its "XML Binary Characterization Properties" document, describing properties desirable for MTOM, XOP or any other serialization of the XML data model.

MTOM and XOP have much broader vendor support than any predecessor specification for XML-to-binary serialization. MTOM and XOP describe how to produce optimized binary encodings of XML content within SOAP 1.2 payloads. MTOM and XOP preserve one of XML's great strengths: the transparency of the tagged, logical data structure that a particular document implements.
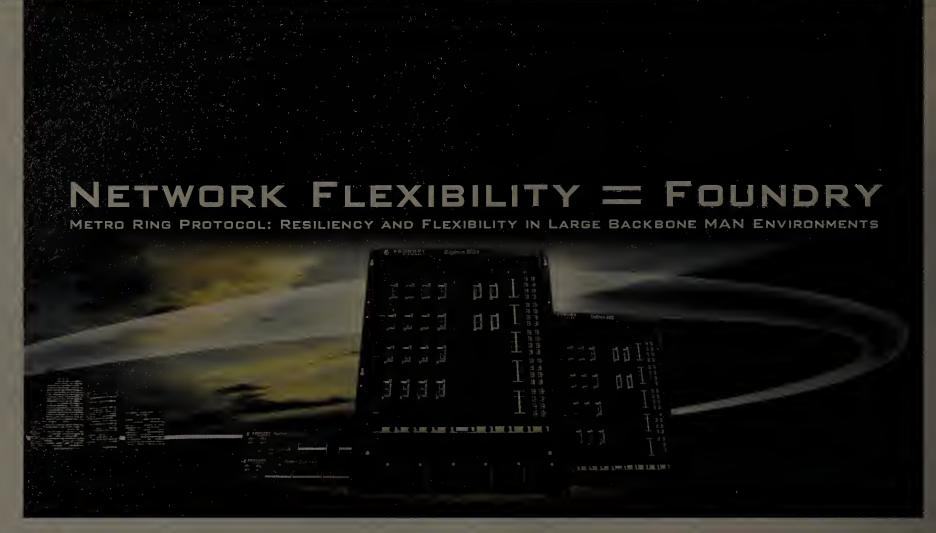
For any given XML document, MTOM and XOP preserve its logical transparency structure by encoding that structure in a text-based "XML Information Set" manifest, while allowing any of the document's contents to be serialized to any binary encoding. In particular, these specifications support binary encoding of XML content as Multipurpose Internet Messaging Extensions Multipart/Related body parts and encapsulation of those parts — along with the associated XML Information Set manifest — within SOAP 1.2 envelopes. The specifications also describe how to encapsulate binary-encoded XML body parts directly within HTTP packets (in cases where SOAP doesn't enter the equation), thereby reducing the size of XML files for transmission and/or storage.

One limitation of MTOM and XOP is that they only can be used to define hop-specific encoding contracts between adjacent nodes within an XML/SOAP-message-handling transmission path. The specifications don't describe how to define global XML-encoding optimization policies that apply across any arbitrary number of XML/SOAP-handling intermediary nodes — an important requirement.

It's important to note that MTOM and XOP aren't yet ratified W3C standards and that few commercial implementations exist. Companies that want to base their XML-optimization strategy on these specifications might have to wait a few years before they are implemented broadly in commercial application platforms, middleware environments and development tools.
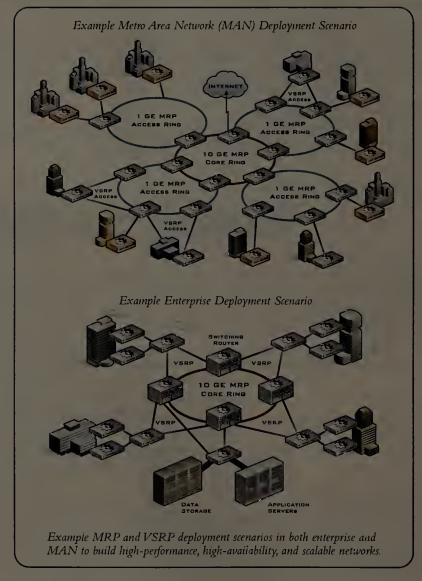
But the industry momentum behind MTOM and XOP is strong. By the end of this decade, IT professionals everywhere will rely on these efficient encoding schemes to tame the XML beast.

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Best practice, practice, practice

COBIT is a proven standard that can help with compliance, business accountability and auditing.

■ BY JOHN MORENCY

IN GENERAL, IT EXECUTIVES IMPLEMENT BEST practices because they need to increase IT predictability and efficiency, reduce support costs, improve customer service quality or meet regulatory requirements.

The two most well-known standards — the IT Infrastructure Library (ITIL) and the Control Objectives for IT (COBIT) — have existed for at least 10 years, support a broad range of management services, are sponsored by very well-respected organizations (COBIT by the Information Systems Audit and Control Organization and ITIL by the IT Service Management Forum) and have been implemented by thousands of organizations of all sizes.

However, COBIT and ITIL are very different in their orientation, definition, classes of problems they address and the specific implications regarding "implementation."

The COBIT standard, which the IT Auditors Association first released in 1996, was designed with business accountability and auditability in mind. For example, a frequent application of COBIT is control definition that helps businesses comply with federal government mandates, such as the Sarbanes-Oxley Act.

Think of a control as a logical safety valve designed to ensure that a specific operation that supports the creation of production financial data executes as intended, without introducing any erroneous or fraudulent data that could compromise the quality of the company's financial reporting.

An example is a set of traceable (and auditable) flows across one or more production applications that reliably increase product inventory when shipments are received from suppliers and decrease product inventory when finished products are shipped to customers. An example of an IT control is the installation of anti-virus software on every new desktop that is installed within a specific facility, along with the ongoing distribution of new virus signatures to each licensed desktop.

IT control definition, testing and progress measurement are task categories that are natural COBIT strengths. The COBIT model is very specific in its definition of the processes and the auditable controls that need to be in place to ensure reliable and predictable IT processes.

The processes defined in COBIT are grouped into four separate domains that align with the IT implementation cycle. They are: Planning and Organization, Acquisition and Implementation, Delivery and Support, and Monitoring.

Each of the 34 processes also has its own assigned number within its parent domain for identification. For example, Problem Management controls and their associated metrics are the 10th process defined in the Delivery and Support domain, while Change Management is the sixth process defined within the Acquisition and Implementation domain.

The definition of each COBIT process also clearly states the control objectives of the process, the critical success factors needed to successfully implement the process, specific quantitative metrics that can be used to measure process quality improvement and a process-specific maturity model that defines the process functionality that progresses from predominantly manual to fully automated and optimized.

In addition, process-specific success factors and quantitative improvement metrics (referred to as the Key Goal Indicators and Key Performance Indicators) are also defined. These can be used as part of a continuous improvement process.

As defined by its authors, COBIT's Management Guidelines are broadly applicable to all major product segments (network, server, storage, application and desktop) within the networked application infrastructure. They are also action-oriented and very relevant to addressing a number of key questions that often are asked when the focus is improving IT governance. This includes:

• How far should we go, and does the benefit justify the cost?
• What are the indicators of good performance?
• What are the critical success factors?
• What are the risks of not achieving our objectives?
• What do others do? How do we measure and compare?

Specific guidelines for support process maturity improvement can help answer some of these questions by providing an objective and measurable set of criteria for assessing the state of current processes, and determining the steps required to achieve and quantify measurable improvement.

COBIT vs. ITIL

COBIT and ITIL are more complementary than they are competitive.

COBIT focuses on the definition, implementation, auditing, measurement and improvement of controls for specific processes that span the entire IT implementation life cycle. As such, it is an excellent reference model for IT governance across the entire implementation life cycle.

The primary focus of ITIL is to provide best practice definitions and criteria for operations management. More specifically, ITIL primarily focuses on defining the functional, operational and organizational attributes that need to be in place for operations management to be fully optimized in two key categories. These categories are called Service Support Management and Service Delivery Management, each of which has a number of supporting subcategories.

The management subcategories for Service Support Management include Service Desk, Incident, Problem, Configuration, Change and Release management, while those for Service Delivery Management include Service Level, Financial, Capacity, Service Continuity and Availability.

Each subcategory definition includes best practice criteria for many areas, including organizational support, cross management component integration, management reporting, product capability, implementation quality and customer service quality.

If your goal is improving the quality and measurability of IT governance across the entire networked application implementation life cycle or implementing a control system for improved regulatory compliance, COBIT probably would be a more effective choice.

On the other hand, if the objective is to continuously improve IT operations efficiency and IT customer service quality, ITIL would probably be the better bet.

However, one should not look at these comparisons as a COBIT vs. ITIL analysis. It's important to understand the design center differences of each approach and adapt them as needed to meet the specific requirements of your own unique environment.

Given the substantial implementation experience with both standards that exists in the industry today, you'll have plenty of peers to call on for advice. The even better news is that, unlike hardware or software products, their acquisition cost is extremely low.

Morency is a managing director of Transitional Data Services, a service provider in Hopkinton, Mass., that specializes in IT orchestration for small and midsize companies. He can be reached at jmorency@transitionaldata.com.

The COBIT model

The 34 IT processes defined in COBIT are grouped into four domains that align with the IT implementation cycle.

Business objectives

COBIT

Information
• Effectiveness
• Efficiency
• Confidentiality
• Integrity
• Availability
• Compliance
• Reliability

Monitoring

Planning and organization

IT resources
• People
• Application systems
• Technology
• Facilities
• Data

Delivery and support

Acquisition and implementation

CLEAR CHOICE

TEST

Voice over WLAN

Aruba is the top dog if you want to add voice traffic to an enterprise wireless LAN

■ BY DAVID NEWMAN, NETWORK WORLD LAB ALLIANCE

VoIP should be an easy fit for wireless LANs, but mixing the two technologies today is difficult. Despite VoIP's low-bandwidth profile, even a small amount of data traffic on the same network can lead to seriously degraded audio quality and dropped calls, even with QoS features enabled.

That's the major conclusion of our first-ever assessment of VoIP capability in WLAN systems. Over the course of three months we tested WLAN switches and access points from Aruba Wireless Networks, Chantry Networks (now Siemens), Cisco and Colubris Networks in terms of audio quality, QoS enforcement, roaming capabilities, and system features. Other vendors, including Airespace, Meru Networks and Trapeze Networks, declined to participate (see "How we did it" at www. nwfusion.com, DocFinder: 5326, for a complete list of invitees).

Among our major findings:

● With QoS enforcement enabled, the products delivered near-toll-quality audio, provided only voice traffic is active. This is fine as long as the wireless network carries voice traffic only, but that's not likely as companies move toward converged voice-data networks.

● When voice traffic had to contend for bandwidth (even with a little data traffic), dropped calls were common and audio quality on the remaining calls was poor in many cases — and this was with QoS enforcement enabled.

● With data traffic present, roaming from one access point to another took anywhere from 0.5 to 10 seconds — in cases where roaming succeeded at all. These long delays and dropped calls made roaming practically impossible with some vendors' gear.

While some products struggled mightily in our tests, Aruba's A2400 and A800 switches and A61 access points were consistently strong performers. The Aruba products posted generally excellent numbers, regardless of how much

voice or data traffic was thrown at them. Aruba's gear just worked, earning it the Clear Choice Award.

Two issues confounded other vendors. First, when handling voice and data traffic on the same network, vendors need to pay attention to metrics such as delay and jitter rather than forwarding rates.

Many vendors are only just beginning to tune their products for voice/data convergence, even though some have touted that capability for 18 months or more. However, it's still relatively early days for VoIP over WLANs. Test tools that accurately measure these metrics on WLANs (such as the VeriWave instruments we used) are only just beginning to appear, and this test is among the first to measure audio quality, delay and jitter in a methodical way.

Second, the emerging 802.11e standard for QoS on WLANs might bring some relief. The 802.11e specification wasn't yet ratified when we began this project, so by definition all QoS methods were non-standard. Companies might want to wait until the new 802.11e specification and products based on it are more mature and fully tested.

Measuring voice quality over wireless

Our tests sought to answer a simple question: How does a VoIP over WLAN system sound?
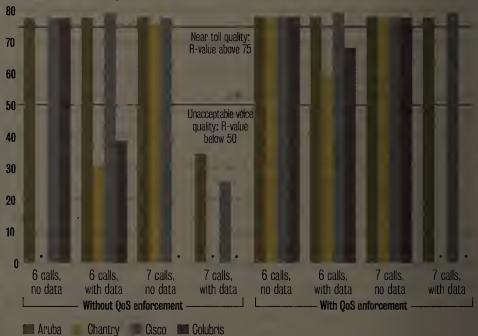
To find out, we worked with VeriWave, a start-up that makes WLAN test and measurement equipment. VeriWave developed a new application, the VoIP over WLAN Analysis Test Suite, especially for our test.

In addition to collecting delay and jitter statistics, VeriWave's test suite and Test-

Voice quality with and without QoS

Tests with six and seven concurrent calls make clear why QoS enforcement is a must when handling VoIP traffic on WLANs. Even with QoS enabled, audio quality (R-value) suffered when VoIP traffic had to share bandwidth with data traffic.

R-value (tested through one access point)

Near toll quality: R-value above 75

Unacceptable voice quality: R-value below 50

| 6 calls, no data | 6 calls, with data | 7 calls, no data | 7 calls, with data | 6 calls, no data | 6 calls, with data | 7 calls, no data | 7 calls, with data |

└─── Without QoS enforcement ───┘   └─── With QoS enforcement ───┘

■ Aruba ■ Chantry ■ Cisco ■ Colubris

All systems also delivered R-values around 78 for a single call, but because all systems also put up comparable scores for one call even without QoS, we omitted the single-call comparison here.

* N/A: Calls dropped, could not measure R-value.

Point hardware let us measure R-value, an ITU specification (G.107) for determining call quality. R-value is an objective measurement, computed directly from measurements of packet loss, jitter and delay. While R-value is objective, it has a strong correlation to the subjective Mean opinion score method in ITU standard P.80 (see R-value ratings, left).

We measured voice call quality with up to 14 handsets and an H.323 call server from SpectraLink, a maker of 802.11 handsets. We measured audio quality with up to seven concurrent calls, and in some events configured the VeriWave TestPoint boxes to offer background data. For each system tested, we checked call quality with QoS disabled, then enabled.

Audio quality without QoS

With QoS disabled, we started by rout-

ing all calls through one access point. Because all the vendors recommend enabling QoS for voice traffic, this baseline test gave us a "before" picture to demonstrate the need for voice traffic prioritization.

With QoS turned off, all four systems tested did fine with only a single call active, with R-values hovering around 78. That is about as good as it gets with VoIP over wireless. The threshold for near-toll-quality voice is generally considered to be around 75, meaning the systems delivered good audio quality for a single call.

Performance for all systems changed across the board when we placed six or seven calls through a single access point and switch, especially when data traffic was active. Yet even without background data, we could not test the Colubris system with seven calls active and QoS disabled — all the calls dropped.

R-value ratings

An ITU specification that determines call quality, R-value measures packet loss, jitter and delay.

R-value	Mean opinion score	User satisfaction
90 or higher	4.34 or higher	All users very satisfied
80 or higher	4.03 or higher	All users satisfied
70 or higher	3.60 or higher	Some users dissatisfied
60 or higher	3.10 or higher	Many users dissatisfied
50 or higher	2.58 or higher	Nearly all users dissatisfied

When we configured the TestPoints to offer background data (a stream of User Datagram Protocol [UDP] packets at 1M bit/sec), the results were positively awful without QoS. With only six concurrent calls, R-values for all systems (except Aruba) were generally at or below the point where voice signals were unintelligible or calls were dropped. Sound quality through Aruba's system remained high, roughly the same as with no data, even without QoS.

The Chantry and Colubris systems could not perform the background data test with seven calls (QoS disabled). All calls failed as soon as the VeriWave box began offering background data.

All vendors recommend the use of QoS mechanisms for handling voice traffic, even when no data traffic exists. QoS is a must when handling VoIP traffic over a WLAN.

Adding QoS to the mix

We reran the same five test configurations as in the non-QoS cases: We measured one call with no background data, and six and seven calls with and without the 1M bit/sec background UDP traffic.

We expected much-improved results once we enabled QoS, but only Aruba's system put up consistently excellent results in all the tests with QoS enforcement. Even in the most stressful case (seven calls plus background data), the Aruba system delivered near-toll-quality. With QoS enabled on the Aruba equipment, there was little difference between the least and most stressful test scenarios.

Other vendors' QoS mechanisms did little to protect call quality when background data was present. On the plus side, QoS mechanisms generally did an excellent job when only voice traffic was present.

Audio quality improved for all systems in cases where we used only voice traffic. In tests with six and seven calls (no background data), all systems delivered near-toll-quality results with QoS enabled.

That changed when we added the background data. With six calls and data active, R-values fell below 70 for the Colubris CN1250, meaning that "some users [would be] dissatisfied" according to the ITU R-value specification. The R-value was about 60 for the Chantry switch ("many users dissatisfied").

Beyond the objective R-value scores, we did some subjective spot-checking of call quality when data was present. Sure enough, we heard echoes, dropouts and generally poor voice quality whenever the TestPoints offered a datastream.

Things got worse for Chantry, Cisco and Colubris when we tried seven calls plus data. Chantry's BeaconMaster couldn't handle this test case; all seven calls failed when we added data. Cisco's WLSM posted an R-value of about 50, the bare minimum level at which calls are intelligible. Further, three of seven calls dropped during this test on Cisco's gear. The Colubris CN1250 completed the test, but didn't forward enough voice frames for the test equipment to compute an R-value score. R-value scores for this test were only computed for the calls that remained active during the 30-second test (so in Cisco's case, it was on four calls instead of seven).

SpectraLink generally recommends a maximum of six concurrent calls per access point, not the seven we used in our tests. Thus, vendors might complain that our seven-call scenario was an overload test case. That is valid, but only up to a point. First, the Chantry and Colubris systems had trouble even with the recommended maximum of six calls with data. Second, Aruba's system could handle the seven calls with data scenario. Third, our most stressful test came nowhere near overloading the wireless medium. We offered

3M bit/sec of traffic or less in all tests, including voice and data. That's not even near the amount needed to saturate the wireless channel (see story on wireless architecture remaining diverse, DocFinder: 5330).

It's possible to run each access point with seven calls and data, provided the system is designed for it. But doing so requires careful attention to timing (see story, right).

Delay and jitter measurements

Delay and jitter are critical metrics for any application, but are especially important when dealing with voice or video. When delay or jitter rises to 50 to 70 millisec, voice quality starts to degrade (see graphic, left). With six calls and background data, the average delay measured below 50 millisec for all vendors, but maximum delay and jitter shot up to much higher levels, topping out at more than 250 millisec in tests of Cisco (six calls) and Colubris gear (seven calls).

An analysis of the logs produced by the TestPoints found several reasons for the voice quality degradation. Anytime jitter exceeds 60 millisec, audio quality begins to suffer. As the maximum delay and jitter numbers rose, R-values fell — and that's for the calls that survived the 30-second test. When delay and jitter rose too high, the calls simply dropped.

Doubling the access points

So would throwing more access points at the problem help? We re-ran all our tests on two access points, with half the phones associated to each access point.

With two access points, the R-values were generally much higher (see online test results, DocFinder: 5327). That wasn't surprising, considering each access point does half the work as in the first set of tests. Average delay also increased, which was expected given the additional component in the traffic path.

While this suggests performance can improve with more access points, it also raises several concerns. Cost goes up, even with thin access points. Second, wireless spectrum is limited, and depending on placement, too many access points will interfere with one another. Third, performance still was not perfect with two access points; we had some dropped calls in the presence of background data.

With a mobile workforce you can't predict how many users will try to associate with a given access point at a given time. Every access point has a saturation point, and our results suggest that point is relatively low when voice is added.

Roam if you dare

Mobility for voice is a major driver for a WLAN deployment. Just as cellular phone users move from one coverage area to another, so too will WLAN handset users.

We measured the time needed for a call to migrate from one access point to another, with both access points attached to the same switch. We also tracked R-value, delay and jitter.

To force the handsets to roam, we pow-

Delay and jitter with QoS

Delay and jitter are the critical metrics for VoIP traffic. While all systems kept average delay relatively low, the big spikes in maximum delay and jitter translated directly into poor voice quality or even dropped calls.

Time (in millisec; tested through one access point)

Legend: ■ Aruba ■ Chantry ■ Cisco ■ Colubris

*Chantry not tested; seven calls failed.

QoS enforcement: What happened?

Three of four vendors in this test failed to protect voice traffic in the presence of data, even using QoS mechanisms specifically intended to do so. Why did these QoS mechanisms fail, even with the vendors' best experts configuring them?

There are a number of factors that might explain our results.
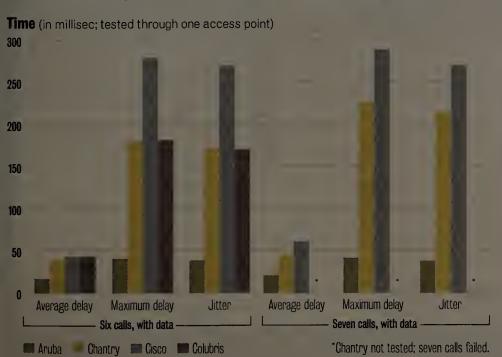
Timing is everything. The importance of keeping delay and jitter low can't be overemphasized when it comes to voice traffic. Some QoS mechanisms work in terms of bandwidth and frame loss; if a given traffic class consumes more than a set amount of bandwidth, packets belonging to that class get dropped. That's not sufficient for voice. Even "strict priority" mechanisms, which always service a given traffic class first regardless of the consequences for other classes, only work properly if they receive high-priority packets in the first place. That's not so easy to do with 802.11 traffic. The IEEE protocols involve large amounts of management traffic and also require that every data frame be acknowledged. At the same time, the SpectraLink phones send out one frame about every 30 millisec and seem to falter anytime four or five packets in a row are dropped. These twin constraints make it critical that wireless LAN (WLAN) systems nail down the timely delivery of as much traffic as possible. In our tests, only the Aruba system did that.

It's not about the bandwidth. At most, we threw less than 3M bit/sec of traffic at each system — and that includes both voice and data. Given that four vendors cracked the 6M bit/sec mark in last year's tests, the initial suspicions of some vendors that we simply overloaded the systems with data doesn't hold up. This test emphasized timely servicing of high-priority traffic, not high data rates.

Access points aren't hot rods. The typical "thin access point" consists of a relatively modest CPU, a limited amount of RAM and firmware. By itself, those components aren't enough to ensure timely traffic delivery. Instead, vendors must rely on precise scheduling mechanisms in their switches (as Aruba does); reduce the number of concurrent calls (which improves performance, as we will discuss in covering tests with two access points); or deploy voice-only WLANs and don't allow data clients (not a practical alternative for most corporations).

ered off the first access point. This drew objections from two vendors — Chantry and Colubris. Chantry says its roaming capabilities are designed for the case where a user physically moves from one location to another, not when there's a power loss to a given access point.

While it is desirable to test roaming under this condition, we could not put enough space between access points in our 1,200-square-foot lab for this approach to be practical. We considered using the Veri-Wave TestPoint as a noise generator, but rejected that option because it was no more representative of physical mobility than the power-off test. Also, loss of power is a real (if uncommon) occurrence; if the access point goes away for whatever reason, a WLAN system needs to seamlessly migrate associated users to a nearby alternative.

The Colubris CN1250 could not be tested by turning it off. The vendor handles mobility through Mobile IP, which requires a home agent — the station where a client first learns its IP credentials — to remain active. If the access point that hosts the home agent goes down, so does the ability to roam. Cisco also supports Mobile IP, but did not use that technology in our tests.

Instead of pulling the plug on the CN1250, we tested roaming by disabling the radio on the first access point. This had the same effect of forcing the clients to roam.

Colubris also requires a third access point to function as a foreign agent, which relays information about clients that roamed back to the home agent. For this purpose, we used a third Colubris CN1250 with its antennas removed; there is no requirement that the foreign agent needs wireless connectivity.

As before, we measured roaming in configurations involving one, six and seven calls, with and without our background data. Cisco has bragging rights in the single-call case, with a roaming time of 0.433 seconds, and all systems roamed one call in

about 0.5 seconds (see graphic, DocFinder: 5328). A half-second gap is noticeable to the human ear — as is any gap of around 70 millisec or more — but except for this dropout audio quality was generally high.

Aruba excelled in the roaming tests. Its average handoff times ranged from about a half-second for one call, to just more than 1 second for the seven-calls-with-data scenario. While that kind of delay will be noticeable to callers, it was still by far the fastest roaming performance of any product.

In Cisco's case, we could perform seven-call roaming tests, but not six-call tests because of time constraints. Average roaming times doubled from 0.433 seconds with one call, up to 1.053 seconds with seven calls — and then it leapt to 4.324 seconds with seven calls and background data.

Colubris could roam with six calls, but not seven. In the seven-call case, we could not prevent some phones from "pre-roaming" to the second access point before our test, which invalidated the results. We also had similar issues in testing with six calls, but the handsets stayed associated long enough for us to record the results, with and without background data. Even so, the results are counterintuitive — roaming took an average of more than 5 seconds without data, vs. about 2 seconds with data.

Chantry's BeaconMaster couldn't perform the roaming test with six or seven calls, even without background data present. Calls would drop rather than roam in those configurations. In troubleshooting the problem, we reduced the number of calls to see if it was a load problem. It was: In our power-off scenario, the highest number of calls that could roam through the BeaconMaster was only two. Two-call roaming times were similar to the one-call case, but we're not presenting those numbers because of the much-lower call count than the other vendors.

VeriWave's new test gear helped us contrast roaming at the 802.11 link layer and at the application layer, and the results

were startling. In many cases, delays of even a few dozen milliseconds in link-layer 802.11 roaming led to delays of 10 seconds or longer at the application layer. Even vendors' engineers were surprised at the enormous disconnect between Layer 2 and Layer 7 measurements. The fact that even minor issues at the link layer had a major effect at the application layer underscores the need for well-behaved 802.11 implementations.

Remote roaming

Because WLAN switches can manage access points at remote locations, we wanted to know whether roaming times and call quality would be affected if the access points are in different locations than the switch. For example, would roaming times differ if the WLAN switch was in Boston and a user roamed between two access points in Los Angeles?

We re-ran the roaming tests, this time using an AX/4000 traffic generator/analyzer from Spirent Communications to inject a 100-millisec, round-trip delay. This is roughly the delay that traffic would experience going between Boston and Los Angeles.

We completed this test with only Aruba and Cisco. Chantry's BeaconMaster couldn't sustain six or seven concurrent calls. Colubris consists of an access point but no switch, ruling out remote roaming tests. For remote roaming, we tested with seven calls (time constraints prevented us from testing Cisco's gear with six calls).

Without data, local and remote roaming times were essentially identical for both vendors (see graphic, DocFinder: 5329). With data present, Aruba's roaming times rose from about 1 second in the local case, to about 3.5 seconds in the remote scenario. Cisco's remote roaming time was actually lower than the local test, which is counterintuitive. We cannot explain this result, but at least it validates Cisco's claim that access points can "pre-authenticate" clients, resulting in no performance penalty for remote access points.

So what now?

It's possible that products supporting 802.11e QoS will do better at prioritizing traffic than our results indicated. All the vendors said it was early in the evolution of VoIP over wireless, and our test results show there is certainly room for improvement. For network managers looking to deploy VoIP on WLANs in the near future, there are three choices: make very few calls; don't ever send data; or look for equipment — such as Aruba's — that handles time-sensitive traffic in a timely way.

Newman is president of Network Test, an independent benchmarking and network design consultancy in Westlake Village, Calif. He can be reached at dnewman@network test.com.

More Test Results Online:

We've got more details on our voice-over-WLAN testing, including:

- Complete methodology and test-bed diagram.
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- Local roaming QoS results.
- Remote roaming QoS results.
- Voice quality through two access points.

www.nwfusion.com, DocFinder: 5331

Net Results

| Aruba A2400, A800 switches, A61 access point | 4.58 | Cisco WLSM | 3.53 | Colubris CN1250 | 3.0 | Chantry BeaconMaster | 2.4 |

Aruba A2400, A800 switches, A61 access point — OVERALL RATING 4.58 — NetworkWorld CLEAR CHOICE
Company: Aruba Networks. **Cost:** $8,780 as tested. **Pros:** Outstanding voice prioritization capabilities; rich set of QoS and radio frequency management features. **Con:** Some call drops in most stressful test case.

Cisco WLSM — OVERALL RATING 3.53
Company: Cisco. **Cost:** $51,978 as tested. **Pros:** Highly scalable, rich set of routing and switching functions. **Cons:** Doesn't protect voice traffic under most stressful test case; doesn't dynamically adjust to changes in radio frequency environment; pricey.

Colubris CN1250 — OVERALL RATING 3.0
Company: Colubris Networks. **Cost:** $1,800 as tested; access point, $500. **Pro:** Powerful and intuitive user interface. **Con:** Limited prioritization of voice traffic.

Chantry BeaconMaster — OVERALL RATING 2.4
Company: Chantry Networks (recently purchased by Siemens). **Cost:** $5,180 as tested. **Pro:** Supports Open Shortest Path First routing. **Cons:** Dropped calls in six- and seven-call cases; poor voice quality in the presence of data; no contingency for the loss of power.

The breakdown	Aruba	Cisco	Colubris	Chantry
QoS enforcement for VoIP traffic 25%	5	5	5	5
QoS enforcement for VoIP and data traffic 25%	4.5	1.5	1	1
Roaming 20%	4	4	2	1
Features 20%	5	4.5	3	2
Price 10%	4	2	5	3
TOTAL SCORE	4.58	3.53	3.0	2.4

Scoring Key: 5: Exceptional; 4: Very good; 3: Average; 2: Below average; 1: Consistently subpar

Face-off

Is PON the cure for last-mile bandwidth bottlenecks?

Two industry insiders debate the benefits of passive optical networking vs. Active Ethernet.

Yes, by John Griffin

Passive optical networking, specifically Gigabit PON, already is proving to be the cure for last-mile bandwidth bottlenecks. Service providers are in a race to deliver high-speed, triple-play services through fiber-to-the-premises architectures. In fact, most major telecom providers have committed to FTTP — and their technology of choice for the access portion of the network is PON.

Competing technologies, such as Active Ethernet, simply don't fit the access world. A point-to-point architecture isn't the most cost-effective, interoperable, scalable and manageable way to get multiple services to a large number of geographically diverse users.

Standards-based GPON, on the other hand, fits perfectly with the business model most carriers have planned for providing multiple services to multiple customers. With PON, the service provider lowers the cost for high-speed, high-bandwidth services by using a shared optical infrastructure. Each service — voice, video and high-speed data — has unique performance characteristics that require different bandwidth allocations and capabilities. While this could pose significant challenges to competing technologies, a GPON system is designed to meet the diverse QoS needs of current and future service offerings.

The use of fiber cable has continued to migrate from large points of aggregated bandwidth, such as large businesses and single points-of-presence, to small businesses and residential consumers. The challenge today is in transporting smaller amounts of bandwidth from a large number of customers back to a centralized point. The beauty of PON is its inherent point-to-multipoint architecture, which easily aggregates multiple customers back to the central office environment, much the same way utility companies provide shared services among many users.

PON provides extensive benefits to service providers. First, it dramatically lowers operations costs by eliminating expensive electronic elements from the outside plant portion of the network. It further lowers cost by spreading the expense of high-powered, long-distance optics across a number of users by leveraging its point-to-multipoint distribution architecture. The GPON standard also enables scalability as bandwidth demands continue to increase for voice, video and data services. Service provisioning costs are reduced, longer reach is achieved, and minimal fiber is required.

Numerous carriers have adopted and implemented PON, specifically GPON, as their "competitive edge" in bringing triple-play services to premises customers. Most of the RBOCs have announced plans to bring high-bandwidth voice, video and data services to hundreds of thousands of residential and small-business customers — and already have decided to build FTTP networks based solely on PON in the outside plant.

By winning the backing of the RBOCs by providing benefits in every major area — cost, scalability, interoperability, long reach, reliability and manageability — standards-based PON is poised to dominate the access world and break the last-mile bandwidth bottleneck once and for all.

Griffin is executive vice president of Optical Solutions, a vendor of FTTP technologies. He can be reached at jgriffin@opticalsolutions.com.

No, by Dave Curry

Optical technology is the clear cure for last-mile bandwidth bottlenecks, but Active Ethernet, not passive optical networking, will be the technology of choice. Deploying PON today might provide more bandwidth than DSL or cable modems, but it also introduces limitations that severely restrict the potential of an optical infrastructure.

Notably, PON architecture imposes bandwidth limits — hardly ideal for easing a bottleneck or gaining revenue by offering more services. Bandwidth is shared among subscriber terminals. The total amount and range of bandwidth available depends on the specific type of PON technology and the split ratio deployed. Speed upgrades can come in one of two ways: reduce the number of subscribers and bear the increase in cost per subscriber, or completely overhaul the technology.

In contrast, Active Ethernet supports a minimum of 100M bit/sec symmetrical connection to each subscriber, far in excess of PON. More importantly, Active Ethernet scales seamlessly to 1G bit/sec, 10G bit/sec and beyond, fully supporting any combination of subscriber access speeds and application requirements.

A large portion of the first cost of a PON deployment is the central terminal, which requires a unique and expensive optical transceiver. When PON vendors highlight low cost per subscriber figures, they imply that each central terminal is fully utilized. However, the cost per subscriber increases dramatically when the number of subscribers is less than approximately 70% of the maximum number of supported subscribers.

Every aspect of an Active Ethernet solution, including the optical transceivers, uses standard off-the-shelf components. Because optical transceivers are only added when subscribers are added, Active Ethernet exhibits very linear costs from the first few subscribers to many thousands of subscribers.

PON vendors say passive components result in significantly lower operational expense. The truth is that even in a passive network, all the central units and subscriber terminals will incur an ongoing operational expense and require the same support as in an Active Ethernet network.

Anyone concerned about the security of the information they send over a public network should be wary of PON. Because of the shared nature of PON, information intended for one subscriber is sent to all subscribers connected to the same passive splitter. The receiving terminals are expected to discard traffic not intended for the subscriber on that terminal. Services delivered over an Active Ethernet infrastructure are contained within virtual LANs that only send the information to the specific destination for which it is intended.

In a day and age when success is based on who can most rapidly meet customer demands at the lowest cost, PON is a fading technology. Only by embracing Active Ethernet can service providers make the most of the vast potential of their optical network investments.

Curry is president and CEO of World Wide Packets, an Ethernet access networking vendor. He can be reached at dave.curry@wwp.com.

Management Strategies

■ CAREER DEVELOPMENT
■ PROJECT MANAGEMENT
■ BUSINESS JUSTIFICATION

Diageo distills IS leaders

The alcoholic beverage company's career development program pushes staff to excel.

■ BY CARA GARRETSON

When Jasmin Chanana was offered a permanent position at the end of 2003 at spirits, wine and beer maker Diageo, accepting it was a no-brainer. He'd been working as a consultant for the company for more than a year and knew he would find the alcoholic beverage industry a refreshing change from the stodgy world of financial services.

But it wasn't just being able to say,"Hey, I work for that company" when someone at a bar orders a Guinness that attracted Chanana. What the 30-year-old saw was an opportunity for growth. After less than a year as a project manager working with Diageo's Web sites and portals, Chanana was given the chance to lead a server consolidation project. Launched three months ago, the project entails consolidating infrastructure and application servers across Diageo North America, which is headquartered in Stamford, Conn.

Chanana had been through Diageo's project management training program, and his manager recognized his potential to take on the role. "People saw the opportunity for growth for me and pushed me in the right direction," Chanana says. "My manager knew the specific needs I had and matched me with an opportunity as it presented itself."

Diageo's career development program, which includes a formal review and goal-setting process as well as a more casual check-up element, helped Chanana land his new job, he says. Over the course of regular career discussions, Chanana's manager identified goals, ensured the necessary training was received and gave Chanana an opportunity to test his project management mettle by taking on the server consolidation project.

Diageo's annual performance reviews, which the company calls people-performance-management reviews, are used to set goals and objectives both by the management and the employee. Monthly checkups, known as call overs, take employees out of their day-to-day work to examine their progress and realign goals as needed.

"Monthly call overs are a gut check of where you are," Chanana says. "You have your people-performance-management [document], you have your objectives in front of you, and as you go through you get a good sense of where you are on a monthly basis."

This kind of regular contact to discuss career goals is important to employees, who often feel like their own personal aspirations get lost amid corporate expectations, says Janet Scarborough, founder of career counseling and executive coaching firm Bridgeway Career Development. "What most companies fail to do is circle back around to touch base with employees between annual performance evaluations," she says.

However, Scarborough warns that monthly meetings such as Diageo's call overs need to involve action, not just talk, to be truly worthwhile. "If there are no concrete results, the meetings are rendered ineffective," she says. She also questions whether monthly meetings are necessary, given that often not much changes over a 30-day period.

Diageo, formed in 1997 by the merger of smaller companies, isn't focusing on career development solely for the benefit of its employees. By identifying career goals and unearthing opportunities for related training, the company's management can align employees' efforts with the business goals of the company, says Andrew Lopatynsky, senior vice president of IT. For example, training an IS employee in how the business side of the house

works would better enable him to develop systems than if the employee went about his job without understanding his users' needs.

"IS staff career development is of utmost importance, whether that means encouraging participation in outside conferences, internship programs or short-term special project assignments," Lopatynsky says.

Throughout the elements of its career development program, Diageo emphasizes two-way, open communication so that employees and managers can highlight opportunities for growth, Lopatynsky says. While senior managers will gather every six months to discuss their employees' career goals and search for fits within the organization, employees also are encouraged to seek opportunities and outline strategies for taking advantage of them. They're even given a vocabulary to help express some less-tangible goals.

For example, Chris Brown, Diageo's director of information management, tells the story of an employee in his data quality group who wanted to become a better "influencer," a term the firm uses. "We built into her development plan an area called 'getting better at influencing,'" Brown says. As her manager, Brown will identify courses she can take and books she can read to hone her influencing skills, which in turn will benefit the company.

"We want our people to be influencers, to have a little edge and drive themselves," he says. "For a technology person, an influencer has the ability to take an idea or concept, look at the business value of that concept and then essentially sell that concept into the business."

While Brown says that many of his employees are interested in taking their careers to the next level, not all are looking to move into the corner office some day. For those who don't want to climb the management ranks, Brown says the career development program still can be of assistance by helping employees take on more responsibility or achieve greater success in their current roles.

"We've put a program in place that makes sure [employees] are technically growing all the time, not just for themselves but also for the benefit of the company," Brown says. ■

Andrew Lopatynsky, senior vice president of IT, and Jasmin Chanana, a project manager, are both spirited about drinks maker Diageo's IT career development program.

CHRIS CASABURI

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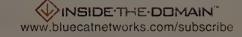
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Tuesday
continued from page 1

day that's filled with coffee, work and more work.

"We know we won't get any sleep when it's Patch Tuesday," says Michael Murray, director of nCircle's Vulnerability & Exposure Research Team (VERT), whose engineers rarely go home before 2 a.m. on the big day.

Microsoft last year released 45 security bulletins and patches; 18 of them deemed "critical" (the highest rating) and 19 "important" (the second-highest). October was the busiest and most crucial month, as Microsoft hit customers with 10 patches, seven rated "critical."

As soon as Microsoft releases its patches, nCircle's programmers in San Francisco and Toronto begin unraveling the fixes. It's a race between them and hackers who might be doing the same. The engineers have 24 hours to meet service-level agreements with their customers to determine what has changed in the software and to deliver tests that the customers can use to decide whether their systems need to be patched.

Microsoft doesn't publicize the changes, so that exploits for the vulnerabilities can't be created — not immediately anyway.

Knowing Microsoft's patch schedule lets the programmers mentally prepare for Patch Day. Murray is based at nCircle's Toronto office, but for Patch Tuesday on Dec. 14, 2004, he's at the San Francisco facility.

The day begins on a promising note: Microsoft is 5 minutes early, issuing its patches at 10:05 a.m. Four VERT engineers in San Francisco gather at the compa-

ny's "war room," a tiny office that's barely large enough to house a table that sits eight people. Nine engineers in Toronto wait for Murray to open the phone bridge, which will stay open all day.

Microsoft has issued five patches, each rated "important." Murray, his PowerBook perched on the table amid cables, two digital projectors and the conference call unit, clicks between the pages Microsoft has posted about the vulnerabilities and patches. He scribbles on a whiteboard the vulnerabilities and their Microsoft-assigned numbers, "041 Wordpad, 042 DHCP, 043 Hyperterminal, 044

More on patching
- Look to next week's issue for a special collection of features on patch management.
- View the patch management showdown we hosted online in November.
  www.nwfusion.com, DocFinder: 5346

Kernel/LSSAS, 045 WINs." He puts a cross next to each of the five to denote that they are all "locals," meaning that they could be exploited via e-mail or by people on the system. Next to the Dynamic Host Configuration Protocol (DHCP) and WINs vulnerabilities are two more crosses, denoting that they are also "remotes" — services that are accessed remotely.

"I'll buy lunch for anyone who writes an exploit for Wordpad," quips Christian Hunt, manager of VERT in San Francisco. Murray assigns teams; all the "locals" will go to the Toronto engineers, and

San Francisco will take the "remotes." The teams are scheduled to meet every three hours.

Back at their cubicles just outside the war room, the engineers download the patches onto an instance of the affected operating system that they've created using VMware's emulation software. They grab the binaries from the patches and load them into the IDA Pro disassembler tool from DataRescue. IDA reveals the lines of code written by Microsoft programmers, and nCircle engineers pore over the evidence to pick out the differences in the patched and unpatched software.

The engineers jump back and forth from their cubes to the war room, where Murray and Jeremy Cooper, a senior software engineer, are sitting, swapping notes and advice. Sometimes the engineers will communicate via Internet Relay Chat or cell phones — even though they are in the same building. Other times they un-mute the bridge with Toronto (this is most often done by Hunt, who mercilessly teases his Canadian colleagues). By 11:45 a.m., the tests for 041 and 043 are ready for quality assurance, and Murray orders pizza.

Cooper and Hunt are working on the DHCP vulnerability. Cooper has attached his laptop to the projector and is looking at the DHCP patch that IDA has disassembled. He notices that there are 41 procedures of the DHCP that can be queried directly from the network, but he sees something else that could lead to his first clue. Procedure No. 28 is "Get DHCP version number." He knows Microsoft often renames version numbers in the executables of patched software, and if the patched and unpatched versions of the DHCP show different DHCP daemon version numbers that would be a huge turning point for Cooper and Hunt.

But then Hunt discovers that the unpatched version of DHCP has only 29 procedures that can be queried. These are the "a-ha" moments that keep the programmers interested. "This isn't work; it's fun with a paycheck," says Cooper, the resident disassembling expert, who in his spare time writes code, plays computer games and is a member of a reggae band.

By 12:50 p.m., the Toronto team has finished creating the rules that will make up the tests for all the "locals" and is waiting to put them through quality assurance. The Canadian team thinks the

tests will be customer-ready two hours after they pass quality assurance.

By 2:05 p.m., the air is getting dry in the San Francisco war room; projectors and laptops are spewing hot air, and pizza crusts and empty soda cans litter the table. Hunt is sitting beside Cooper and both have their laptop screens projected on the wall to show the code for the unpatched and patched DHCP. They've finished writing a program to call up Procedure 28 and are waiting for another engineer to create a DHCP test environment. To while away the time, Hunt returns to teasing his Canadian colleagues, who keep forgetting to mute their phone connection.

NCircle keeps a range of popular operating systems, including Linux, NetWare and Solaris, running in its test lab, but it has to be able to mirror most customer environments, however antiquated. The company scours eBay and flea markets for old software, and Murray says the oddest recent customer request has been to test a NetWare 3 environment. "But getting old software is less difficult than finding old hardware to run it," he says.

At 2:55 p.m., the test packages for 041 and 042 are through quality assurance and tests for the rest of the locals are in quality assurance. The rules for the remotes of 045 and 042 are still being developed. Murray says the teams don't compete with each other; rather they compete with the times of the previous months. The record for tests to be finished and ready for shipping is four hours for locals and six hours for remotes, Murray says.

Hunt and Cooper think the DHCP daemon version number has changed from 1.1 in the unpatched version to 4.1 in the patched. They use their test program to call up Procedure 28 —

but wait! They discover a huge mistake that would wreak havoc on customers' networks if the customers made the same error. The test has delivered a denial-of-service attack to the test system by calling up the wrong procedure. Everyone runs to the test machine at an engineer's cube to view the dreaded Dr. Watson screen. "Dude, we found another vulnerability!" they exclaim.

The second attempt at calling Procedure 28 on the unpatched version is successful: The version number is showing 1.1. But the test of the patched version is also showing 1.1. That's not good. It turns out human error was to blame again, as the wrong patch had been applied to the test environment. The next attempt is successful, and everyone is relieved. "OK, dump it and make it into a rule," Murray says to Cooper. The detective part of the work is done, and the situation is like "Hawaii Five-O's" Steve McGarrett saying: "Book him, Danno."

The time is 4:45 p.m. "It should just take me 30 minutes to turn this into a rule," Hunt says. But coffee and a cigarette break come first. Murray hands Hunt VERT's pre-paid card for the coffee shop.

Finishing the test for WINS proved to take the longest. The engineers created a test early in the evening, but after Hunt and Cooper finished their work on the DHCP they set about helping to look for a better test of the WINS vulnerability. "We had extra energy," Murray says. The engineers in San Francisco finished at 2 a.m. After catching a few hours' sleep at home, they came back into the office to see the test through quality assurance, and everything was shipped to customers just before 10 a.m.

Patch Tuesday in December came and went. Tomorrow will no doubt be another late one for the nCircle engineers and other such teams across the industry.

BackSpin Mark Gibbs

Divine divination

Welcome to 2005! As this is the crystal ball issue, I was looking for predictions about the coming year. I was tempted by molybdomancy (divining from the shapes created by dripping molten lead into cold water) but in the end decided to go with the traditional goat's entrails. So, here's what 2005 has in store for us …

1. **Phishing:** You thought 2004 was bad! 2005 is going to be a phishing nightmare. As a consequence, banks and other financial institutions are going to have to rethink how they communicate with their customers online.

2. **Spyware:** You thought 2004 was bad! 2005 is going to see an explosion of spyware. I'd make sure there's some flexibility in your budgets because you are going to have to spend money on this problem. However much you think it will cost, it will not be enough.

3. **Old spam:** 2005 will see spam growth slow compared with what we saw in 2004. The volume of spam will cruise along at an average of 80% to 85% of all Internet SMTP traffic. The bad news is that the spammers will get smarter and more creative in their attempts to end-run your filters.

4. **New spam:** Watch out for non-commercial spam becoming a bigger percentage of the total spam volume. Already we've seen a noticeable increase over the last few months in political and religious spam, and this trend will accelerate over 2005.

5. **Stupid legislation:** The government will continue to try to enact ridiculous laws regarding any aspect of the online world in response to lobbyists with deep pockets. It appears to have learned nothing from CAN-SPAM in 2004. 2005 will be much the same.

6. **The Motion Picture Association of America:** Talking about lobbyists with deep pockets, the MPAA will continue down its path of blind futility of trying to plug a hole in a dyke that was completely demolished years ago. It does not learn fast, and 2005 will not teach the association much.

7. **Cyberterrorism:** Despite the fact that there hasn't been any cyberterrorist acts to speak of, the same mythical beast still will get lots of column inches and political posturing. Even so, 2005 is unlikely to see the Department of Homeland Security's National Cyber Security Division becoming useful or effective.

8. **Copyrights and software patents:** Despite a lot more pressure and much discussion in 2005 based on logical, well-constructed valid arguments, there will be no movement toward rationalizing the copyright system or the patent system regarding software.

9. **Novell:** There's a very good chance that in 2005 we're going to see Novell arise, phoenix-like, from the ashes of its own marketing burnout with solid positioning in the Linux market.

10. **Microsoft:** 2005 will be more of the same: The company will continue to fight with the European Union but it won't really inconvenience Microsoft very much. It will come under increasing criticism for its security problems, and some kind of malware will cause a major meltdown of tens of thousands of Windows-based servers at least once in the year. Microsoft will not stop lying about the total cost of ownership of Windows compared with Linux. Someone at Microsoft will spill the beans about internal matters, much to our amusement.

11. **Linux:** The growth of Linux will be solid and troublesome to Microsoft, but 2005 isn't going to see a wholesale defection away from Windows-based servers. Sorry, that's just the way it will be.

12. **The SCO Group:** Goodbye.

So, those are the main signs and portents that I can see. Should you have any thoughts on these matters or predictions, drop me a line and we'll start a watch list to test our collective divinatorial powers. I predict we'll be pretty good.

Future thoughts to backspin@gibbs.com.

NetBuzz News, insights, opinions and oddities

By Paul McNamara

Never mind 2005

With all due respect to my fellow columnists on the preceding pages and at the top of this one, predicting what will happen over the next 12 months is a relatively simple task. After all, the stuff that happened over the previous 12 months offers a good starting point, and conventional wisdom does a credible job of narrowing the variables. So, in the spirit of maximizing the prognostication degree-of-difficulty, and confident that I'll never be held to account, here's what you can expect to see on the technology front 10 years from now in 2015:

The state of Texas conducts the nation's first execution of a spammer and broadcasts the event live over the Internet. Nary a peep of protest is heard from death-penalty opponents.

The first kindergarten students carrying RFID tags — implanted in their buttocks at birth — begin classes at which taking attendance is accomplished instantly by the teacher waving a wand from the front of the room. The country's last remaining privacy advocate merely shrugs.

Bill Gates, 58, announces his retirement from Microsoft, a wholly owned subsidiary of Google. Responding to a reporter's suggestion that he might become bored, Gates reminds his inquisitor that he has enough money to buy Florida and that "the rich are different because we never get bored."

Google, meanwhile, trumpets the company's latest advancement in search technology: a Web-based utility that literally allows one to find a needle in a haystack. The company also acknowledges that it might have too many developers with too little to do, now that it has indexed every word written or spoken — in any language active or dead — since the beginning of time.

A year after the FCC outlaws camera phones as "instruments of indecency," a bill passes both houses of Congress repealing the ban and is signed into law by President Arnold Schwarzenegger. "No one tells 'The Terminator' what's inde-cent," Schwarzenegger bellows just before he disbands the offending regulatory body with one swipe of his sword-shaped pen.

New research shows that the pornography industry spurs more technological innovation and generates more revenue online than any other e-commerce segment, proving once again that some things never change. Ring tones finish second in terms of revenue.

The nation's three largest long-distance carriers — Skype, Vonage and Wal-Mart — discover that issuing monthly gratuity checks in order to recruit and retain customers, instead of collecting payments from them, is not a sustainable business model.

Former WorldCom CEO Bernie Ebbers strolls out of a federal prison — tanned, rested, but destitute — after completing a 30-day wrist-slap that had been delayed for almost a decade by a string of costly legal appeals that had the unintended side benefit of leaving him penniless.

According to IDC, Firefox is now the Web browser of choice for fully 90% of Internet users, a threefold increase since the product's development was wrested from the Mozilla Foundation and brought under the auspices of The Microsoft Open Source Consortium.

Offshoring stories reappear in the news as heavyweight technology manufacturers in China and India begin to transfer their low-paying call center jobs to the U.S. so that their own highly skilled workforces can devote more time to development work.

Appliance makers — we're talking toasters and refrigerators here, not network boxes — pull the plug on the Internet connectivity features in their products that had been hyped since the late 1990s but delivered only 18 months earlier. Reason? Too many virus-sparked kitchen fires followed by too many lawsuits.

Signs sprout up in public places that alert passers-by to the fact that wireless Internet access is not available where they stand.

Feel free to write if I'm wrong. The address is buzz@nww.com.

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